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ABSTRACT

This manual is the second part of a two-volume teacher's guide to a series of instructional units for use in health occupations education programs in Texas. Covered in the 10 units included in this volume are the following topics: special procedures (administering oxygen to patients; using elastic bandages; assisting with postural drainage; and assisting with hot and cold treatments, therapeutic exercise, and physical restraint of patients), assisting with diagnostic procedures (collecting specimens and positioning and draping patients for medical examinations), transporting patients, charting, medical laboratory procedures, standard first aid treatment, metrics for health occupations, human relations, safety, and anatomy and physiology. Each unit contains most or all of the following: objectives, suggested activities, information sheets, transparency masters, job sheets, assignment sheets, a unit test, and answers to the unit test. (MN)

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Units of Instruction

HEALTH OCCUPATIONS EDUCATION

Volume II

Teacher's Guide

Prepared by Catherine Williams

CE 036 313

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USE OF THE INSTRUCTIONAL UNITS

The H.O.E. instructional units cover certain instructional areas in the classroom program. Each instructional unit includes most or all of the basic components of a unit of instruction: performance objectives, suggested activities, information sheets, assignment sheets, job sheets, transparency masters, unit tests, and answers to the unit tests. Units are planned for more than one classroom period of instruction.

Careful study of each instructional unit will enable the teacher to determine:

A. The amount of material that can be covered in each class period

B. The skills that must be demonstrated

C. The supplies and equipment needed for skill performance

D. The amount of classroom time needed for teacher demonstration and student practice

E. Supplementary materials that may be ordered

F. Any resource personnel who must be contacted

The specific components of an instructional unit perform the following functions.

OBJECTIVES

Each unit of instruction is based on performance objectives. These objectives specify the exact behaviors the student will be exhibiting, thus providing students with a sense of direction.

Performance objectives are stated in two forms. The unit objectives state the materials to be covered in the unit of instruction and how the student will handle the material. Specific objectives state the types of performance the student will be doing to satisfy the unit objective.

A classroom discussion should follow immediately after the students read the objectives so that any questions concerning the performances expected of the student can be answered.

SUGGESTED ACTIVITIES

Each unit of instruction has a suggested activities sheet outlining steps to follow in accomplishing specific objectives.

Instructor. Duties of the instructor will vary from unit to unit, but the following are minimum activities for the instructor:

1. Provide students with objectives, information, assignment and/or job sheets

2. Discuss objectives and information sheets

3. Make transparencies

4. Demonstrate procedures outlined on job sheets (when included)

5. Give test

Any additional instructional activities and teaching methods to aid students in accomplishing the objectives are strongly encouraged.

Student. Student activities are listed to help the student achieve the objectives of the unit.

INFORMATION SHEET

Information sheets provide content essential for meeting the cognitive requirements of the unit. These sheets provide an excellent guide for presenting necessary knowledges necessary to develop the skills specified in the unit objective.

Students should read the information sheets before the information is discussed in class. Students are encouraged to make any additional notes on the information sheets to help them in their learning process.

TRANSPARENCY MASTER

Transparency masters provide information in a special way. Transparencies may present new information or they may reinforce information presented in the information sheets. They are particularly effective when identification is necessary.

Make the transparencies from the masters and place them in your notebook ready for immediate use.

Copies of transparency masters can be made and used as student handouts to supplement the material contained in the information sheet.

JOB SHEET

Job sheets are an integral part of each unit of instruction. The instructor should be able to demonstrate the skills outlined in the job sheets. Procedures specified in the job sheets give direction to the skill being taught and allow both student and teacher to check student progress in performing the skill. Job sheets provide a ready outline to students and furnish to potential employers a picture of the types of skills being taught.

ASSIGNMENT SHEET

Assignment sheets give direction to study and furnish activities which provide application of the knowledges contained in the information sheet. These may be given to the student for completion in class or used for homework assignments. Answer sheets are provided for checking student progress.

UNIT TEST

Unit test questions have been constructed to measure student achievement of each specific objective listed on the objectives sheet. Individual test items may be pulled out and used as a short test to determine student achievement of a particular objective. This kind of testing may be used as a daily quiz and will help the teacher spot difficulties being encountered by students in their efforts to accomplish the terminal objective.

ANSWERS TO UNIT TEST

Test answers are provided for each unit. These may be used by the teacher and/or student for checking student achievement of the objectives.

PERSONALIZING AND LOCALIZING INSTRUCTIONAL UNITS

Carefully review the instructional units before using the unit in the classroom. In reviewing the units, you may find it necessary to localize and personalize the units based upon the needs of your students.

Some of the ways of supplementing units are the use of audio-visuals, attention-getters, field trips, resource personnel, games and simulations, case studies, peer teaching, role-playing and personal experiences of both the teacher and students.

Various methods may be used in localizing a unit of instruction. You may wish to apply units of instruction to the local community, add additional materials from newspapers and magazines, invite local resource people and arrange for field trips.

In personalizing a unit of instruction, you may want to make the course content relevant to home and/or work situations. You may wish to involve students in the planning of the unit by using their own personal experiences. Having students involved in the teaching of some of the materials is sometimes an effective example of peer teaching.

Remember that as an instructor, you may wish to add any objectives to the units of instruction based on the individual needs of the student. If this procedure is followed, you must add the corresponding information in the information sheet, add any assignment or job sheets as deemed necessary and construct a corresponding unit test item.

UNIT XI

SPECIAL PROCEDURES

UNIT OBJECTIVE

After completing this unit, the student will be able to define terms relating to special procedures. The student will also know ways oxygen is administered to patients, how to use an elastic bandage, and how to assist with postural drainage. The student will know how to assist with hot and cold treatments, therapeutic exercise, and physical restraint or control of patients. This knowledge will be evidenced through demonstration and by satisfactorily completing a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Match terms and definitions associated with special procedures.
2. List four ways oxygen may be given.
3. List and explain safety rules for using oxygen.
4. Discuss six reasons for using an elastic bandage.
5. Discuss the general rules for applying an elastic bandage.
6. Explain the purpose of postural drainage.
7. Discuss body positions in postural drainage.
8. Describe the effect of heat on the body.
9. Discuss three ways external heat is applied.
10. Explain the effect of cold treatment on the body.
11. List three ways to apply external cold treatment.
12. Discuss safety precautions to be followed before applying heat or cold treatments.
13. Discuss use and types of restraints

14. Identify complications that may occur from the use of restraints.
15. Discuss three forms of exercise.
16. Demonstrate the ability to:
    a. Apply an elastic bandage to the ankle
    b. Apply an arm sling
    c. Apply moist heat treatment--hot soaks
    d. Apply dry heat treatment--hot water bottle
    e. Apply dry cold treatment--ice bag
    f. Apply moist cold treatment--cold compresses
    g. Apply arm and leg restraints
    h. Perform a progressive resistive exercise

UNIT XI

SPECIAL PROCEDURES

SUGGESTED ACTIVITIES

I. Instructor

   A. Provide students with objectives sheet

   B. Provide students with information and assignment sheets

   C. Make transparencies

   D. Discuss unit and specific objectives

   E. Show and discuss transparencies

   F. Discuss information and assignment sheets

   G. Have students complete assignment sheets

   H. Set up film projector and show film

   I. Give and evaluate unit test

II. Student

   A. Read objectives sheet

   B. Study information sheets and ask questions

   C. Observe film

   D. Complete assignment sheets

   E. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objectives sheet

   B. Information sheet

   C. Transparency master

      1. XI-TM-1--Body Postions for Postural Drainage

2. XI-TM-2--Flexion: Decreasing the Angle Between Two Bones
3. XI-TM-3--Extension: Increasing the Angle Between Two Bones
4. XI-TM-4--Example of Rotation, Abduction, and Adduction of a Muscle
5. XI-TM-5--Application of an Elastic Bandage to an Ankle and Lower Leg
6. XI-TM-6--Making a Sling

D. Assignment sheets
    1. Assignment Sheet #1--Applying an Elastic Bandage to the Ankle
    2. Assignment Sheet #2--Applying an Arm Sling

E. Answers to assignment sheets

F. Job sheets
    1. Job Sheet #1--Applying Moist Heat - Hot Soaks
    2. Job Sheet #2--Applying Dry Heat - Hot Water Bag
    3. Job Sheet #3--Applying Dry Cold Treatment - Ice Bag
    4. Job Sheet #4--Applying Moist Cold Treatment - Cold Compresses
    5. Job Sheet #5--Applying Arm and Leg Restraints
    6. Job Sheet #6--Strengthening the Quadriceps Muscle Using the Progressive Resistive Exercise

G. Unit test

H. Answers to unit test

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16. Stolten, Jane Henry. The Health Aide. Boston, Massachusetts: Little, Brown, and Co., 1972.

17. Storey, Donna K. Principles and Practices of Nursing Care. Dallas, Texas: McGraw-Hill Book Company, 1976.

18. Thompson, Ella M. and Constance Murphy. Textbook of Basic Nursing. Philadelphia, Pennsylvania: J.B. Lippincott Co., 1966.

B. Films

1. "Circulation of the Blood," Texas Heart Association.

2. "Anatomy and Physiology of the Respiratory System," Audiovisual Support Center of the army area in which you reside.

3. "Bronchitis and Bronchiectasis," Pfizer Laboratories, 267 West 25th St., New York, New York 10001.

4. "Postural Drainage, Clapping, and Vibration" (#191), Trainex, Corp. P.O. Box 116, Garden Grove, California 92642.

5. "Local Application of Heat and Cold (#177)", Trainex Corp. P.O. Box 116, Garden Grove, California 92642.

6. "Strike Back at Stroke," Texas Heart Association.

UNIT XI

SPECIAL PROCEDURES

INFORMATION SHEET

I. Terms and definitions

- A. Oxygen--a gas present in normal air which the body must have in order to survive (chemical symbol for oxygen is O_2)
- B. Bandage--a strip of fabric used to dress and bind up wounds
- C. Sling--a hanging bandage suspended from the neck to support an arm or hand
- D. Dry heat--application of hot water bag, chemical heat pad, or heat lamp
- E. Moist heat--application with hot compresses, hot soaks, or hot baths. Moist applications are more penetrating than dry ones.
- F. Dry cold--application with ice bag, ice cap, or collar
- G. Moist cold--application of compresses or cold packs. Moist cold is more penetrating than dry cold.
- H. Restraint--restriction of freedom
- I. Passive exercise--movement by an attendant of the patient's limb through the range of motion
- J. Active exercise--movement by the patient by active muscle contraction of the limb
- K. Vasoconstriction--contraction of the blood vessels
- L. Ecchymosis--bruise following an injury such as a contusion
- M. Vasodilation--dilation of the blood vessels
- N. Contusion--an injury in which the skin is not broken

O. Mottling--a condition marked by discolored areas

P. Penetrating--going below the surface

Q. Ambulatory--walking

R. Hypnotic--a drug that induces sleep

S. Restraints--devices that limit the patient's ability to move in order to protect the patient from injury

II. Four ways oxygen may be given

A. By nasal catheter

B. By nasal cannula

C. By nose and mouth mask

D. By oxygen tent

III. Safety rules for using oxygen

A. Post and observe "no smoking" signs in any room or units in which O_2 is used. One sign should be posted at the door or entrance and another sign should be posted on the O_2 tank.

B. See that the patient and the visitors are warned of the danger and cautioned against lighting matches.

C. Do not use ordinary electrical devices in the area, including heating pads, hot plates, razors, machines, and radios. Special sparkproof equipment, such as the motor for an O_2 tent, is used when necessary.

D. Do not wear fabrics that carry sparks and do not allow the patient to wear them. These fabrics include wool, silk, rayon, nylon, and other synthetics.

E. Cotton blankets should be placed on the bed.

F. The patient should be dressed in cotton

G. Friction can cause sparks. Do not use alcohol, oil, or lotion to rub the patient.

IV. Six reasons for using an elastic bandage

  A. To hold a dressing in place

  B. To support an injured limb

  C. To prevent an injured limb from swelling

  D. To prevent swelling of the feet and legs in patients with heart and kidney diseases

  E. To prevent clots from forming in the leg veins after surgery or childbirth

  F. To relieve pressure on varicose veins

V. General rules for applying an elastic bandage

  A. Elevate the limb before applying the bandage.

  B. Apply the bandage with a gentle, equalized tension and overlapping layers.

  C. Ask the patient if the bandage feels tight. It should be comfortable but give support.

  D. After a bandage is applied, watch for swelling and cold or blue skin before re-wrapping the area.

  E. Remove the bandage at least once in every eight hours and leave it off for 20 minutes before re-applying.

  F. Check skin carefully during each rest period for changes in the skin.

VI. The purpose of postural drainage

  A. To increase the removal of bronchial secretions. The patient is positioned so that gravity will help to move the secretions toward the head.

  B. Patients for whom postural drainage is indicated will fall into the following disease categories

    1. Obstructive bronchitis-emphysema

    2. Bronchiectasis

    3. Resolving pneumonia

    4. Lung abcess

    5. Necrotizing pneumonia

VII. Body positions for postural drainage

A. Specific body positions are used to drain specific areas of the lungs and bronchi.

B. The patient's individual medical history, symptoms, and diagnosis are all factors in determining which position will be of greatest benefit.

C. Examples of commonly used positions are illustrated in XI-TM-1.

VIII. The effects of heat on the body

A. Expands blood vessels

B. Increases circulation to area of treatment

C. Stimulates drainage of infections

D. Reduces congestion or inflammation

E. Soothes nerve endings

F. Helps relax muscle tension

G. Helps relieve certain types of pain

IX. Three ways external heat is applied

A. Dry heat--by lamps, exposure to sunlight, electric pads and blankets, room heaters, and hot water bottles

B. Moist heat--by soaks, compresses, steam inhalators, irrigations, baths, and chemical packs

C. Medicinal heat--by applying an irritant such as oil of wintergreen, liniment, or mustard plaster to the skin

X. The effects of cold treatment on the body

A. Contracts blood vessels

B. Decreases circulation

C. Deadens nerve endings

D. Controls major infection

E. Deadens pain

XI. Three ways to apply external cold treatments

A. Dry cold--by ice bags (caps or collars), air conditioning, and chemical packs

B. Moist cold--by soaks, compresses, baths, and irrigations

C. Medicinal cold--by spraying on the skin. Cold is often applied in this fashion to anesthethize a small area for a short time.

XII. Safety precautions to be followed before applying heat or cold treatments

A. Know the exact part of the body to be treated

B. Be sure to understand in what way, for how long, and how often a treatment is to be given

C. Be sure equipment is in good condition

D. Position the patient in the most comfortable way that presents the part of the body to be treated

E. Remove any dressing and discard in proper container

F. Use a bath thermometer to check temperature of a hot solution before starting the treatment

G. Caution must be exercised to see that the patient does not lie on an electric pad. The pad must not be used on a patient who is not sufficiently alert to cooperate

XIII. Use and types of restraints

A. Restraints are used only when a doctor orders them, except when the patient is in danger of harming him or herself or others. Then, restraints may be put on until the doctor is notified of the patient's condition.

B. Hand restraints--prevent patients from pulling out catheters, nasal tubes, or intravenous tubes. These are the only purposes that hand restraints serve

C. Bed restraints--prevent patient from getting out of bed

D. Wheelchair restraints--support patients who can not sit up properly in a wheelchair. Applying restraints keeps the patient more comfortable and in better body alignment

E. Restraints on children--must be approached with utmost caution. A careful explanation to the child and the parents must accompany the use of any type of restraints

XIV. Avoiding complications that may result from the use of restraining devices

A. Visit the restrained patient often and provide for toileting needs about every two hours.

B. Change the patient's position frequently and massage the patient's wrists and ankles when restraints are removed.

C. Watch for swelling that may occur in hands and feet if circulation is shut off by restraints.

D. Remember linen burns on elbows, back, hips, and heels may occur because of the constant wriggling motion of the patient in attempting to get the restraints off.

E. Reassure patient to prevent constantly mounting fear and eventually panic that sometimes develops, causing the patient to strain and often break restraints.

F. Avoid exhaustion and dehydration of patient

G. Death sometimes occurs during ward emergencies, such as fires, unless the ward personnel remember to release the patient in time, or when attendants are unaware of the patient with restraints.

XV. Forms of therapeutic exercises:

A. Range-of-motion exercise--an activity designed to restore active motion in the joints. May be done by an attendant if the patient is unable to perform this activity. (See XI-TM-2-3)

B. Progressive resistive exercise--an activity designed to restore strength to muscles. The exercise consists of repeated maximal muscle contraction against resistance. The muscles gradually become stronger as the amount of resistance is increased

C. Skill or Coordinated Exercises

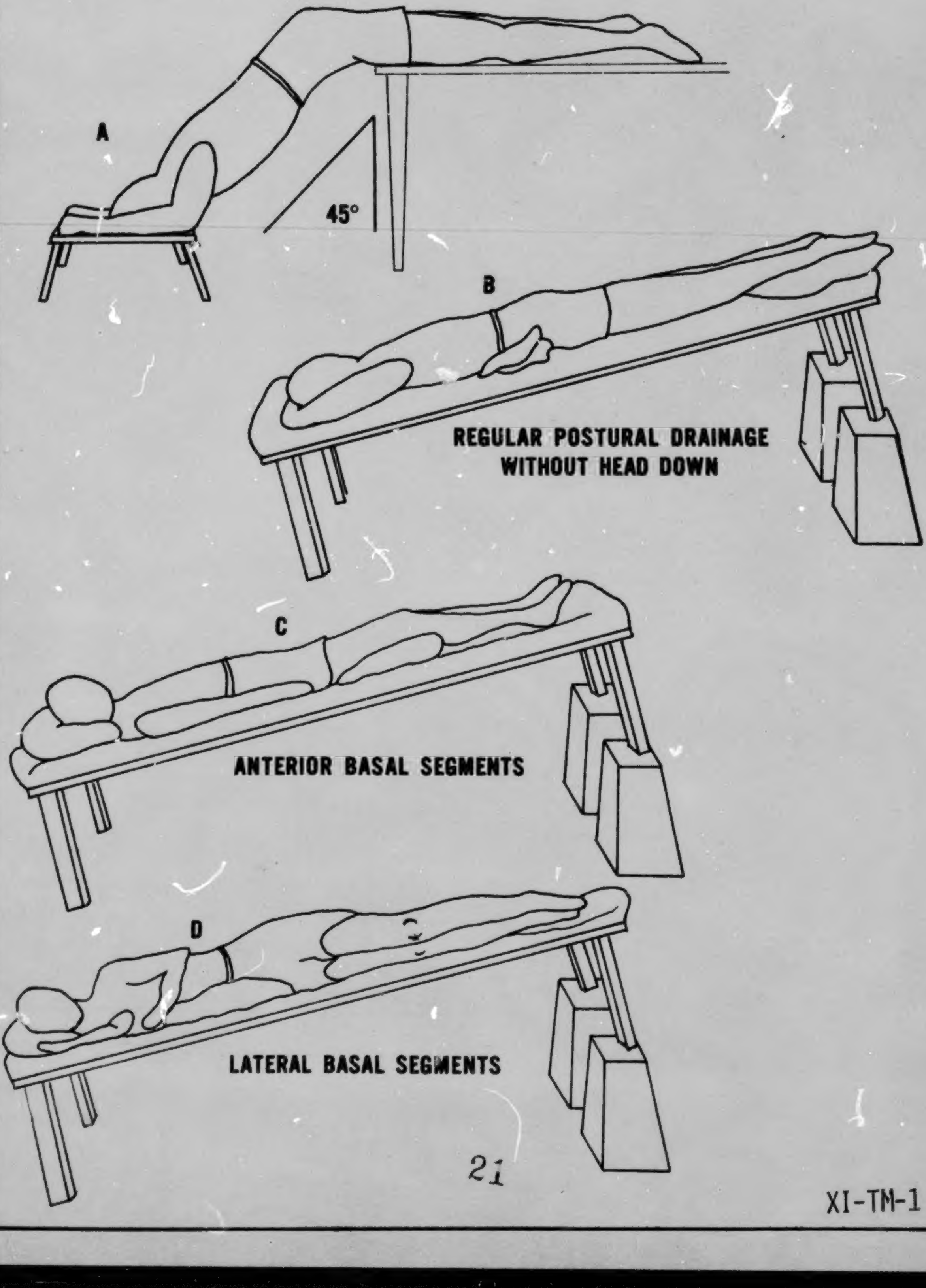
1. Improvement of skills, coordination, and balance increases the control which the individual has over various muscle contractions.

2. Every skill motion, like tying shoelaces, writing,or sketching, depends on the intact functioning of various components of the nervous system.

3. Skill exercise is used on patients with injury to the central nervous system resulting in impairment of movement.

4. Coordinated exercises can be used on patients with lung disease or an ailment which diminishes the expansion of the chest, and thus decreases air exchange to the lungs.

BODY POSITIONS FOR POSTURAL DRAINAGE

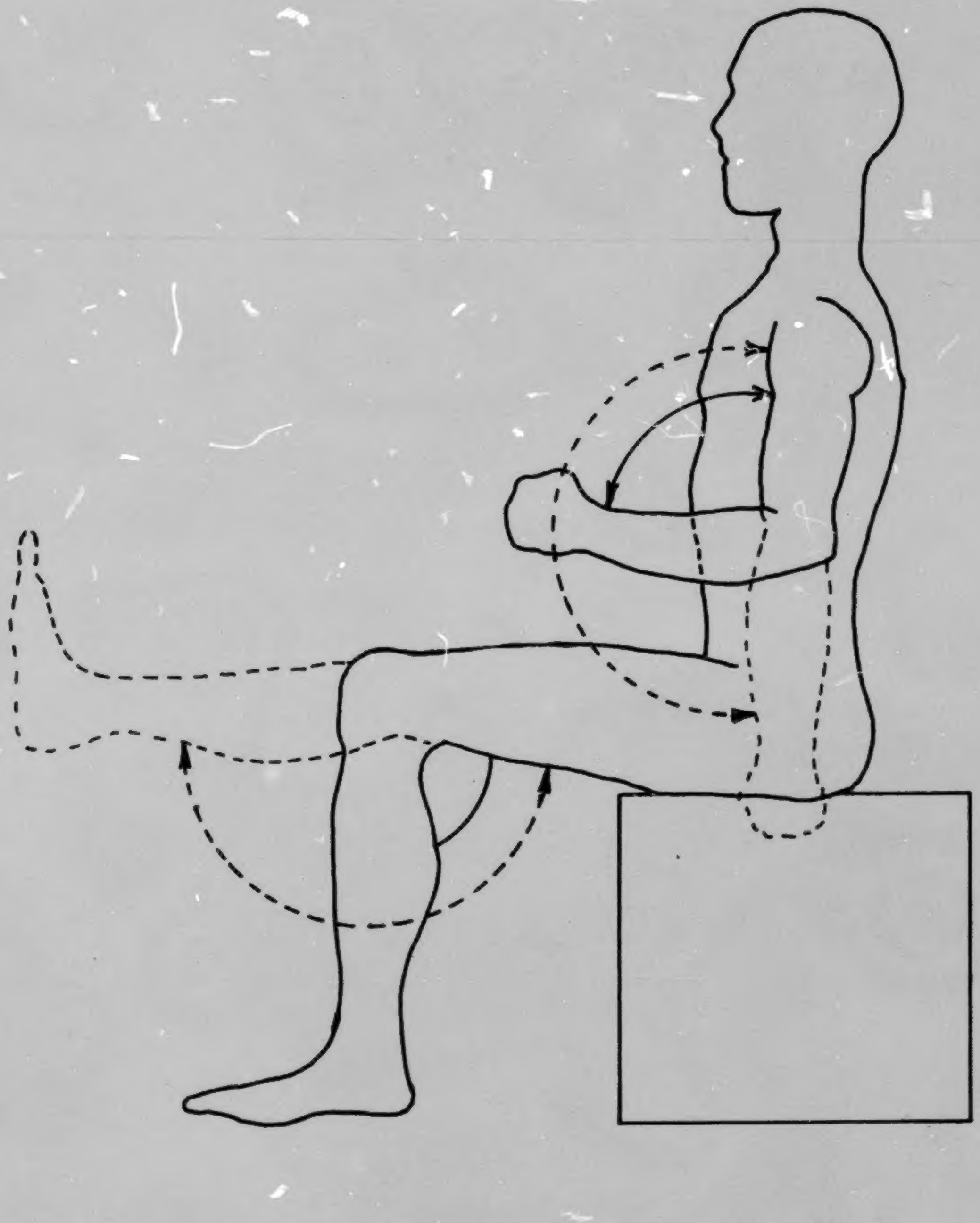


REGULAR POSTURAL DRAINAGE WITHOUT HEAD DOWN

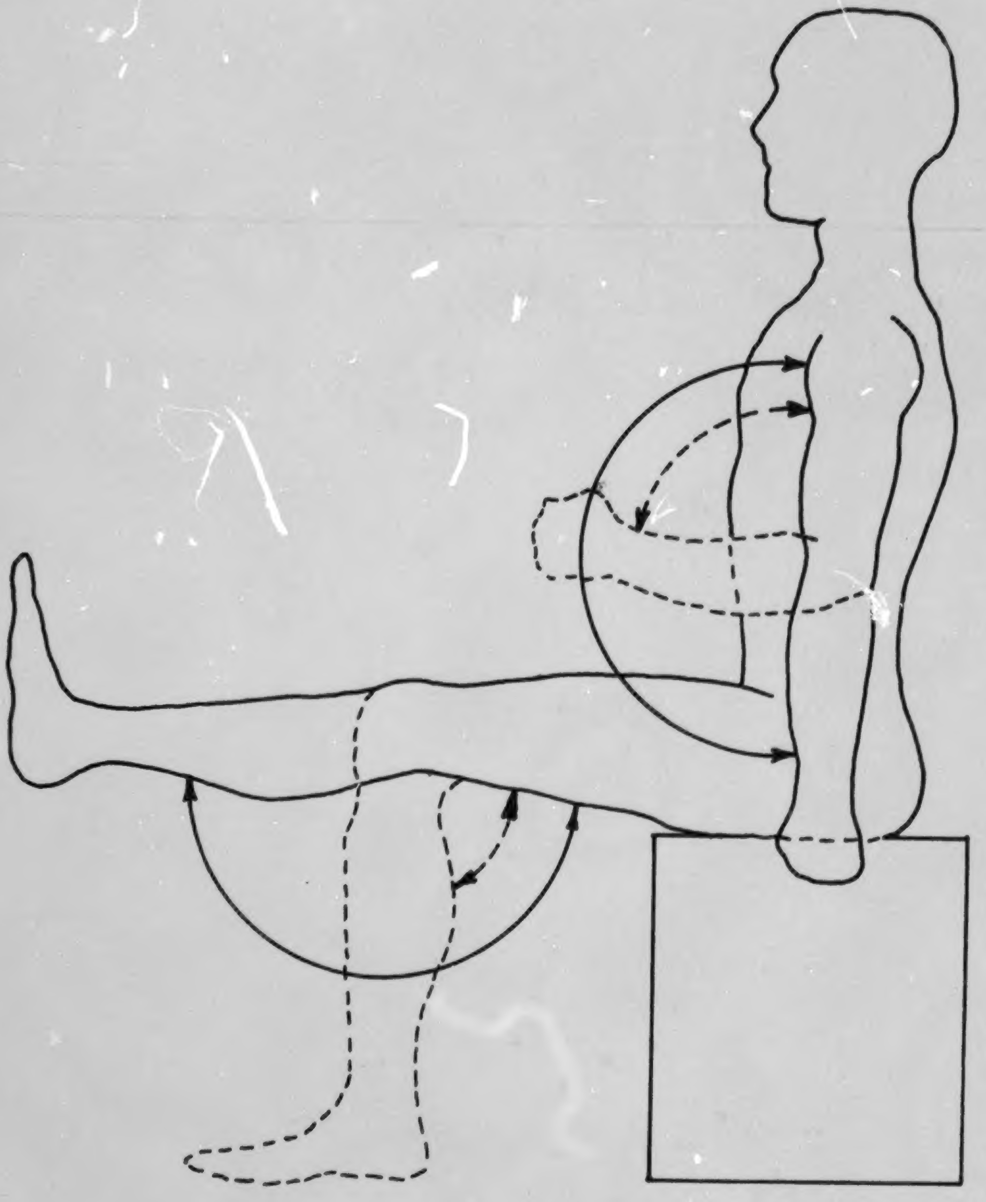
ANTERIOR BASAL SEGMENTS

LATERAL BASAL SEGMENTS

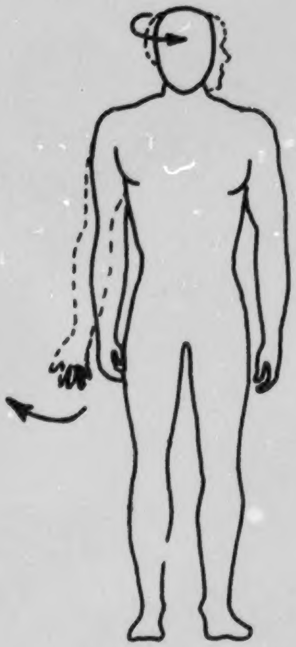
FLEXION: DECREASING THE ANGLE BETWEEN TWO BONES



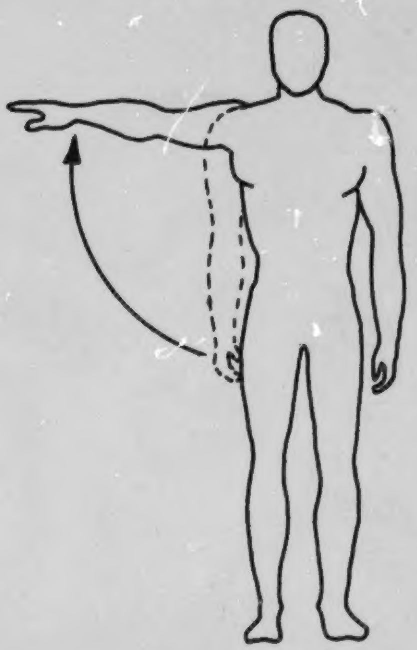
EXTENSION: INCREASING THE ANGLE BETWEEN TWO BONES



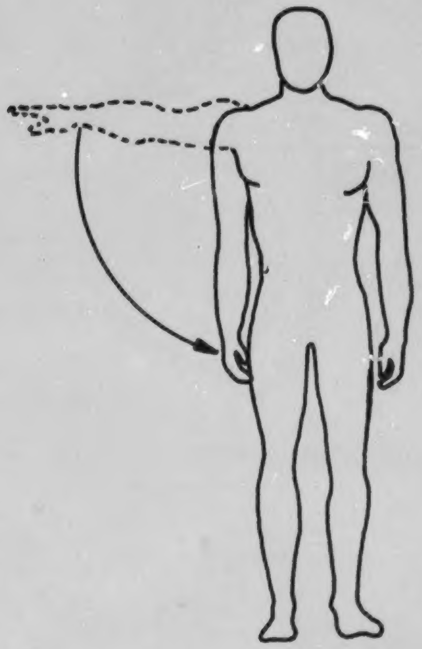
EXAMPLE OF ROTATION, ABDUCTION, AND ADDUCTION OF A MUSCLE



ROTATION

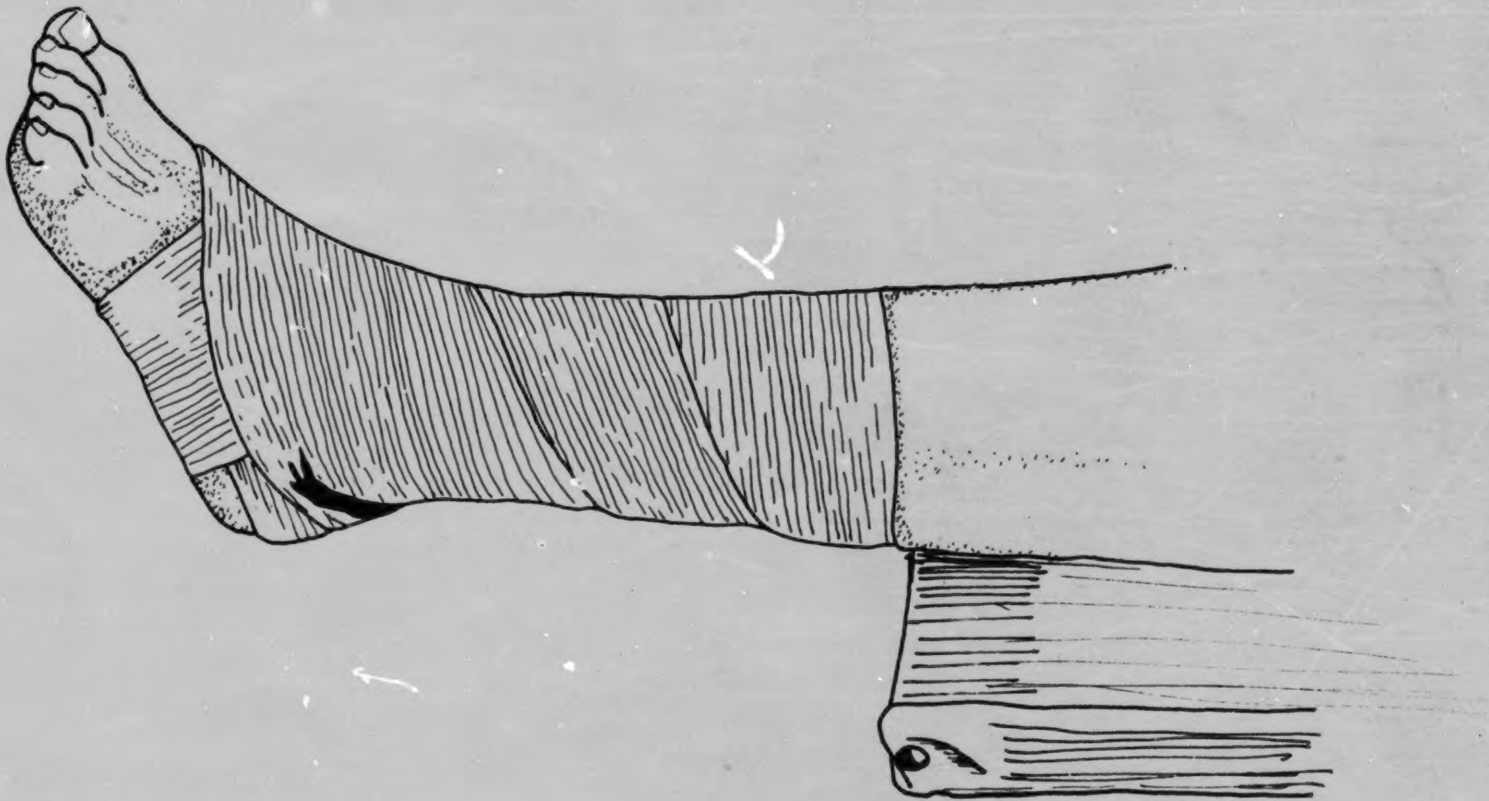


ABDUCTION



ADDUCTION

APPLICATION OF AN ELASTIC BANDAGE TO AN ANKLE AND LOWER LEG



XI-TM-5

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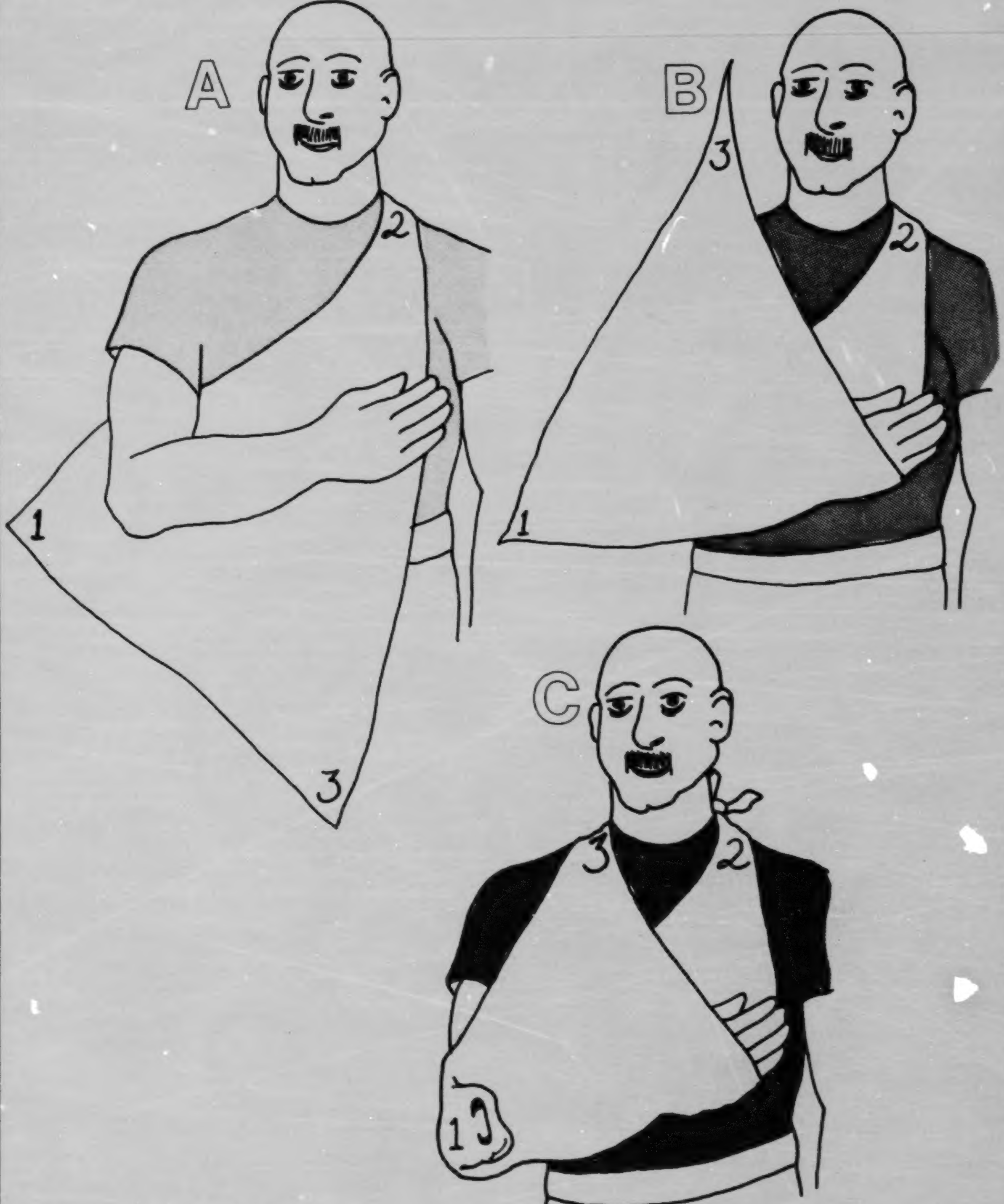
XI-23

MAKING A SLING


A
2
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B
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C
3
2
1

UNIT XI

SPECIAL PROCEDURES

ASSIGNMENT SHEET #1
APPLYING AN ELASTIC BANDAGE TO THE ANKLE

Directions:

1. Obtain an elastic bandage. Place the end of the rolled bandage on top of the arch of the foot, leaving the toes exposed.
2. Wrap the arch twice in the same place to anchor the bandage.
3. Wind the bandage around the ankle, back down to the foot, across the arch and under the foot in a figure eight.
4. Repeat the figure eight, covering a new area of skin but overlapping each time. The heel is not wrapped unless so ordered.
5. Repeat the figure eight if necessary. Then continue wrapping the ankle and leg in spiral fashion, with each turn overlapping the last.
6. Adjust bandage so that the end of the last turn occurs on the outside of the leg.
7. Use clip to secure bandage.

UNIT XI

SPECIAL PROCEDURES

ASSIGNMENT SHEET #2
APPLYING AN ARM SLING

Directions:

1. Assemble materials
    a. Triangle of heavy muslin
    b. Safety pins
2. Have the patient hold the affected arm in a natural and comfortable position, so that the upper arm rests against the patient's side and forearm crosses the patient's waist.
3. Take the muslin triangle by one end of its longest side, hold the length straight up and down in front of the patient with the third corner directed toward the affected arm.
4. Slip the corner nearest the neck under the affected arm and to the back of the neck.
5. Bring the corner nearest the floor up over the affected arm and to the back of the neck.
6. Adjust these corners until the arm has snug, smooth support but is not lifted. The patient's hand should be slightly higher than the arm.
7. Tie the corners at the back of the neck but to one side of the spine. A knot on the bones of the spine causes pain and pressure.
8. Make a square knot to fasten.
9. Adjust the material under the length of the affected forearm so that the wrist and the hand are supported and the fingers are free and visible.
10. Watch the fingers for signs of swelling or cyanosis (turning blue). These signs would indicate an interference with the blood supply.
11. Adjust the material at the elbow to form a neat, snug, corner and fasten with pins to the front of the sling.

UNIT XI

SPECIAL PROCEDURES

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1 and #2 will be evaluated to the satisfaction of the instructor.

UNIT XI

SPECIAL PROCEDURES

JOB SHEET #1--APPLYING MOIST HEAT - HOT SOAKS

I. Tools and equipment required

- A. Basin or tub
- B. Solution,as ordered,in container
- C. Bath thermometer
- D. Two bath towels or blankets
- E. Plastic sheet

II. Procedures

- A. Assemble equipment.
- B. Screen the unit.
- C. Greet patient and explain procedure.
- D. Place the plastic sheet under the basin.
- E. Fill the soak basin less than half full.
- F. Test the water temperature and correct if necessary. (Should be 110°F)
- G. Slowly introduce into the solution the body part to be soaked.
- H. Cover the soaking part with the bath towel or blanket.
- I. Check the time.
- J. Allow the part to soak for the time ordered.
- K. Watch the skin of the soaked area.
- L. Watch the general reaction of the patient.
- M. Remove the soaked part from the basin.
- N. Carefully dry the part.
- O. Clean and replace equipment according to hospital policy.

UNIT XI

SPECIAL PROCEDURES

JOB SHEET #2--APPLYING DRY HEAT - HOT WATER BAG

I. Tools and equipment required

   A. Hot water bag

   B. Container for hot water

   C. Paper towels

   D. Cover for bag

   E. Thermometer

II. Procedures

   A. Assemble and prepare equipment.

   B. Fill container with water and test for correct temperature--120°F.

   (NOTE: Do not test the temperature of running water. Draw the water into a container, then test. Half fill the bag with tested water. Too much water makes the bag heavy.)

   C. Expel air by placing hot water bag horizontally on flat surface, holding neck of bag upright until water reaches neck, and apply the screw top when all air has been expelled.

   D. Wipe hot water bag dry with paper towels and turn bag upside down to check for leakage.

   E. Place cover on hot water bag.

   F. Greet patient and explain procedure. Take equipment to bedside on tray.

   G. Apply to the affected area as ordered, but never allow patient to lie on hot water bag.

   H. Check patient's condition at intervals.

   I. Record

      1. Date and time

2. Procedure
3. Area of application
4. Duration of treatment
5. Patient's reaction
6. Observations

J. Clean and replace equipment according to hospital policy.

K. Repeat procedure as necessary.

UNIT XI

SPECIAL PROCEDURES

JOB SHEET #3--APPLYING DRY COLD TREATMENT - ICE BAG

I. Tools and equipment required

A. Ice bag

B. Cover for bag

C. Ice chips

D. Spoon or similar utensil

E. Paper towels

II. Procedures

A. Assemble and prepare equipment.

B. Fill the bag half full of ice chips. More ice makes the bag too heavy.

C. Expel air by resting ice bag on table in horizontal position, with top in place but not screwed on. Squeeze the bag until air has been removed.

D. Screw top on securely.

E. Test for leakage.

F. Wipe dry with paper towel.

G. Put on the ice bag cover. Do not apply a bag without a cover.

H. Greet patient and explain procedure.

UNIT XI

SPECIAL PROCEDURES

JOB SHEET #4--APPLYING MOIST COLD TREATMENT - COLD COMPRESSES

I. Tools and equipment required

  A. Tray

  B. Large basin half filled with crushed ice

  C. Small basin with the ordered solution

  D. Protective pad

  E. Towel

  F. Rubber gloves, if needed

  G. Gauze compresses (a large number)

  H. Disposable bag

II. Procedure

  A. Assemble and prepare equipment.

  B. Greet patient and explain procedure.

  C. Place the protective pad under the area to be treated.

  D. Cover the pad with the towel.

  E. Position the area to be treated on the towel.

  F. Put on gloves.

  G. Put the gauze compresses into the solution.

  (Note: Ice is never put directly into a compress or soak solution, since a particle of ice can stick to the compress and get onto the skin.)

  H. Wring out some of the compresses as dry as possible.

  I. Stretch and place compresses on area to be treated.

  J. Remove compresses after a few minutes and discard into the disposable bag.

K. Report:

1. Date and time
2. Procedure
3. Area of application
4. Duration of treatment
5. Patient's reaction
6. Observations

UNIT XI

SPECIAL PROCEDURES

JOB SHEET #5--APPLYING ARM AND LEG RESTRAINTS

I. Tools and equipment required

   A. Two wristlets

   B. Two anklets

   C. Three straps

II. Procedure

   A. Take equipment to the patient's bedside.

   B. Explain that you are protecting the patient from falling out of the bed.

   C. Place a wristlet on the patient's wrist. Have this wristlet loose enough to permit you to slip two fingers between the restraint and the patient's wrist. Buckle it in this position.

   D. Check to be sure the wristlet is loose enough to permit you to slip two fingers between the wrist and the restraint; if it is not, loosen it immediately.

   E. Repeat step four and put the second wristlet on the patient.

   F. Loosen the bedclothes at the foot of the bed and fold them back to expose the patient's ankles.

   G. Place an anklet on each leg. Place these so loosely that you can place two fingers between the ankle and the leather anklet.

   H. Remake the bottom of the bed by tucking in the bedclothes loosely.

   I. Check the patient every 15 minutes to be sure that he or she is comfortable and safe.

   J. Remember the patient is helpless, so provide for the patient's personal needs.

K. Remember that restraining devices are used to protect the patient. However, they may become devices of torture if you do not continue to care for the patient who has been made helpless by this application.

UNIT XI

SPECIAL PROCEDURES

JOB SHEET #6--STRENGTHENING THE QUADRICEPS MUSCLE USING THE PROGRESSIVE RESISTIVE EXERCISE

I. Tools and equipment required

   A. 5-lb. weight

   B. 10-lb. weight

   C. 15-lb. weight

II. Procedures

   A. Place the prescribed weight around the ankle or the foot of the patient.

   B. Bring knees into full extension.

   C. Allow patient to remain in this position for five seconds, and then bend again.

   D. Repeat this motion 10 times.

   E. Increase weights as the muscle strength improves.

   F. Repeat exercise for as long as it is ordered.

UNIT XI

SPECIAL PROCEDURES

UNIT TEST

1. Match each of the following terms with the correct definition.

_____ a. A gas that is present in normal air. The body must have this gas to survive.

_____ b. A strip of fabric used to dress and bind wounds

_____ c. A hanging bandage suspended from the neck to support an arm or hand

_____ d. Applied to the body with the hot water bottle

_____ e. Applied to the body with hot compresses

_____ f. Applied to the body with an ice bag

_____ g. Applied to the body with cold packs

_____ h. Contraction of the blood vessels

_____ i. Bruise following an injury such as a contusion

_____ j. Dilation of the blood vessels

_____ k. An injury in which the skin is not broken

_____ l. A condition that is marked by discolored areas

_____ m. Going below the surface

_____ n. Being able to walk

1. moist heat
2. contusion
3. vasoconstriction
4. bandage
5. vasodilation
6. mottled
7. dry cold
8. penetrating
9. ecchymosis
10. oxygen
11. ambulatory
12. moist cold
13. hypnotic
14. sling
15. restraints
16. dry heat

_____ o. A drug that induces sleep

_____ p. A device that limits the patient's ability to move in order to protect the patient from injury

2. Complete the following statements concerning ways oxygen may be given.

   a. By nasal ____________________.

   b. By nasal ____________________.

   c. By nose and mouth ____________________.

   d. By oxygen ___________ _________.

3. Complete the following statements concerning the use of oxygen.

   a. Post and observe __________________ signs in room where gas is used.

   b. See that the patient and visitors are cautioned

      against ___________________ matches.

   c. Do not use ____________________ _______________ in the area where oxygen is used.

   d. Do not wear ___________________ that sparks and do not allow the patient to wear them.

   e. Cotton ____________________ should be placed on the bed.

   f. The patient should be ________________ in cotton clothing.

   g. Friction can cause ________________________.

4. Discuss six reasons for using an elastic bandage.

   a.

   b.

   c.

   d.

   e.

   f.

5. Discuss the general rules for applying an elastic bandage.

6. Explain the purpose of postural drainage.

7. Describe how body positions can increase postural drainage.

8. Answer the following statements by writing TRUE or FALSE , concerning the effect of heat on the body, in the spaces at the left.

_____ a. Heat expands blood vessels.

_____ b. Heat does not increase circulation to the area of treatment.

_____ c. Heat stimulates drainage of infection.

_____ d. Heat does not reduce congestion or inflammation.

_____ e. Heat soothes nerve endings.

_____ f. Heat helps to relax muscle tension.

_____ g. Heat helps to relieve certain types of pain.

9. Answer the following statements True or False concerning the way heat is applied.

_____ a. Dry heat--is applied by lamps, exposure to sunlight, and hot water bottles.

_____ b. Moist heat--is applied by hot oils and liniment.

_____ c. Medicinal heat--is applied by oils, and mustard plaster to the skin.

10. Answer the following statements True or False, concerning the effect of cold treatment.

_____ a. Cold treatment contracts the blood vessels.

_____ b. Cold treatment decreases the circulation.

_____ c. Cold treatment does not deaden nerve endings.

_____ d. Cold treatment is used to control major infection.

_____ e. Cold treatment is often used to deaden pain.

11. Answer the following statements concerning the ways external cold treatments are applied by writing True or False in the blanks at the left.

_____ a. Dry cold--by ice bags, air conditioning, and chemical pack.

_____ b. Moist cold--by soaks, compresses, baths, and irrigations.

_____ c. Medicinal cold--by alcohol and chemical packs.

12. Discuss safety precautions to be followed before applying heat or cold treatments.

13. a. When are restraints to be used?

b. Discuss types of restraints that are applied.

(1)

(2)

(3)

(4)

14. List precautions in the use of restraining devices.

a.

b.

c.

d.

e.

f.

g.

15. Discuss three forms of therapeutic exercise.

    a.

    b.

    c.

16. Demonstrate the ability to:

    a. Apply an elastic bandage to the ankle.

    b. Apply an arm sling.

    c. Apply moist heat treatment--hot soaks.

    d. Apply dry heat treatment--hot water bottle.

    e. Apply dry cold treatment--ice bag.

    f. Apply moist cold treatment--cold compresses.

    g. Apply arm and leg restraints.

    h. Perform a progressive resistive exercise.

    (NOTE: If the above activities have not been completed prior to the test, ask the instructor when they should be completed.)

UNIT XI

SPECIAL PROCEDURES

ANSWERS TO UNIT TEST

1. 10 a.
   4 b.
   14 c.
   16 d.
   1 e.
   7 f.
   12 g.
   3 h.
   9 i.
   5 j.
   2 k.
   6 l.
   8 m.
   11 n.
   13 o.
   15 p.

2. List should include

   a. By nasal catheter.

   b. By nasal cannula.

   c. By nose and mouth mask.

   d. By oxygen tent.

3. a. "No Smoking" signs
   b. Lighting matches
   c. Electrical devices
   d. Fabrics
   e. Blankets
   f. Dressed
   g. Sparks

4. Discussion should include
   a. To hold a dressing in place.
   b. To support an injured limb.
   c. To prevent an injured limb from swelling.
   d. To prevent swelling of the feet or legs in patients with heart or kidney diseases.
   e. To prevent clots from forming in the leg veins after surgery or childbirth.
   f. To relieve pressure on varicose veins.

5. Discussion should include
   a. Evaluate the limb before applying the bandage.
   b. Apply the bandage with a gentle, equalized tension, and overlapping layers.
   c. Ask the patient if the bandage feels tight.
   d. After the bandage is applied, watch for swelling and cold or blue skin before rewrapping the area.
   e. Remove the bandage at least once in every eight hours and leave it off for 20 minutes before reapplying.
   f. Check skin carefully during each rest period for changes in the skin.

6. Explanation should include

   a. To increase the removal of bronchial secretions. The patient is positioned so that gravity will help to move the secretions toward the head.

   b. Patients for whom postural drainage is indicated will fall in the following diseases categories:

      1) obstructive bronchitis - emphysema

      2) bronchiectasis

      3) resolving pneumonia

      4) lung abscess

      5) necrotizing pneumonia

7. Description should include

   a. Specific body positions are used to drain specific areas of the lungs and bronchi.

   b. The patient's individual medical history, symptoms, and diagnosis are all factors in determining which position will be of greatest benefit.

8. True a.

   False b.

   True c.

   False d.

   True e.

   True f.

   True g.

9. True a.

   False b.

   True c.

10. True a.

True b.

False c.

False d.

True e.

11. True a.

True b.

False c.

12. Discussion should include

a. Know the exact part of the body to be treated.

b. Understand in what way, for how long, and how often a treatment is to be given.

c. Be sure equipment is in good condition.

d. Position the patient in the most comfortable way that presents the part of the body to be treated.

e. Remove any dressing and discard in the proper container.

f. Use a bath thermometer to check the temperature of any hot solution before starting the treatment.

g. Caution must be exercised to see that the patient does not lie on an electric pad. The pad must not be used on a patient who is not sufficiently alert to cooperate.

13. A. Restraints are to be used only when a doctor orders them, except when the patient is in danger of harming him or herself or others. Then, restraints may be put on until the doctor is notified of the patient's condition.

B. Discussion should include

1. Hand restraints--prevent patients from pulling out catheters, nasal tube, or intravenous tubes. These are the only purposes that hand restraints serve.

2. Bed restraints--prevent the patient from getting out of bed.

3. Wheelchair restraints--aid patients who cannot sit up properly in a wheelchair and need support. Applying the restraints keeps the patient more comfortable and in better body alignment.

4. Using restraints on children--the application of restraints to a child must be approached with utmost precaution. A careful explanation to the child and the parent must accompany the use of any type of restraint.

14. List should include the following precautions

a. Attendants must visit the patient often, about every two hours, providing for toileting needs.

b. Change patient's position frequently and massage the wrists and ankles when restraints are removed.

c. Watch for swelling in the hands, ankles, and wrists that may occur if the circulation is shut off by restraints.

d. Linen burns on the elbows, back, hips, and heels may occur because of the constant wriggling motion of the patient as he attempts to get the restraints off.

e. Constantly mounting fear and eventually panic may develop causing the patient to strain at the restraints and often break them.

f. Exhaustion and dehydration of patient.

g. Death sometimes occurs during ward emergencies such as fires because the ward personnel forget to release the patient in time, or they are unaware of the patient with restraints.

15. Discussion should include

a. Range-of-motion exercise--used to restore active motion in the joints. Exercise may be done by the attendant if patient is unable to move limbs.

b. Progressive resistive exercise--an activity designed to restore the strength of the muscles. The exercise consists of repeated maximal muscle contraction against resistance. The muscles gradually become stronger as the amount of resistance is increased.

c. Skill or coordinated exercise

  1. The improvement of skills, coordination, and balance increases the control which the individual has over various muscle contractions.

  2. Every skill motion, like tying shoelaces, writing,or sketching, depends on the intact functioning of various components of the nervous system.

  3. Skill exercise is used on patients with injury to the central nervous system resulting in impairment of movement.

  4. Could also be used on patients with lung disease or an ailment which diminishes the expansion of the chest and thus decreases air exchange to the lung.

16. Evaluated to the satisfaction of the instructor.

UNIT XII

ASSISTING WITH DIAGNOSTIC PROCEDURES

SECTION A--COLLECTING SPECIMENS

UNIT OBJECTIVE

After completing this unit, the student will be able to identify terms, discuss procedures, and perform techniques relating to collecting specimens. This knowledge will be evidenced through demonstration and by satisfactorily completing a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Match terms and definitions related to collecting specimens.
2. Describe procedures for collecting specimens.
3. Name the five types of urine specimens.
4. Describe the collecting procedure of the five types of urine specimens.
5. Explain uses of various types of urine specimens in diagnosis.
6. Discuss procedures involved in collecting a stool specimen.
7. Write the procedure involved in collecting a gastric specimen.
8. Explain the procedure involved in collecting a sputum specimen.
9. Demonstrate the ability to:
    a. Collect a routine urine specimen.
    b. Collect a midstream clean catch urine specimen.
    c. Collect a 24-hour urine specimen.
    d. Collect a stool or feces specimen.
    e. Collect a sputum specimen.

UNIT XII-A

COLLECTING SPECIMENS

SUGGESTED ACTIVITIES

I. Instructor

   A. Provide objective sheet

   B. Discuss objective sheet

   C. Pass out information sheet

   D. Discuss information sheet

   E. Distribute and discuss assignment and job sheets

   F. Demonstrate procedures outlined in job sheets

   G. Give test and evaluate results

II. Student

   A. Read and discuss objective sheet

   B. Read and discuss material contained in information sheet

   C. Complete assignment sheets

   D. Demonstrate the ability to perform procedures given in the job sheets

   E. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objective sheet

   B. Information sheet

C. Assignment sheet

    1. Assignment Sheet #1--Collecting Specimens

D. Answers to assignment sheet

E. Job sheets

    1. Job Sheet #1--Collect a Routine Urine Specimen

    2. Job Sheet #2--Collect a Midstream Clean Catch Urine Specimen

    3. Job Sheet #3--Collect a Twenty-Four Hour Urine Specimen

    4. Job Sheet #4--Collect a Stool or Feces Specimen

    5. Job Sheet #5--Collect a Sputum Specimen

F. Test

G. Answers to test

II. References: Books

A. Caldwell, Esther and Barbara R. Hegner. *Health Assistant*. Albany, New York: Delmar Publishers, 1973.

B. Hornemann, Grace V. *Basic Nursing Procedures*. Albany, New York: Delmar Publishers, 1966.

C. Stolten, Jane Henry. *The Health Aide*. Boston, Massachusetts: Little, Brown & Co., 1972.

D. Thompson, Ella M. and Constance Murphy. *Textbook of Basic Nursing*. Philadelphia, Pennsylvania: J.B. Lippincott Co., 1966.

E. Stryker, Ruth P. *The Hospital Ward Clerk*. St. Louis, Missouri: C.V. Mosby Co, 1970

UNIT XII-A

COLLECTING SPECIMENS

INFORMATION SHEET

I. Definition of terms

A. Bile--Yellow-green fluid secreted by the liver, sometimes present in vomitus

B. Catheter--Tubular instrument used to drain or inject fluids through a body passage

C. Contaminate--To make unsterile or unclean by contact

D. Culture--To grow microorganisms on laboratory culture media. (Also, the mass of microorganisms grown on laboratory culture media.)

E. Dysuria--Painful urination

F. Glycosuria--Presence of glucose in the urine

G. Hematuria--Presence of blood in the urine

H. Meatus--An opening or passage in the body

I. Parasite--An organism that lives on or in another organism

J. Requisition--Written request for a test or a service

K. Specimen--Small sample or part intended to show the kind and quality of the whole

L. Sputum--Thick discharge from the lungs and throat

M. Sterile--Free of living organisms; germ-free

N. Stool (feces)--Waste product of digestion elimated through the anus

O. Urethra--Tube leading from the urinary bladder to the exterior of the body

P. Urine--Fluid waste filtered from the body by the kidneys

- Q. Void--To empty the urinary bladder
- R. Vomit--To eject the contents of the stomach through the mouth
- S. Vulva--External parts of the female reproduction system that surround the opening of the vagina and urethra

II. General procedures for collecting specimens

- A. Follow the procedures or policies of the institution
- B. Identify and greet patient
- C. Explain procedure to the patient
- D. Make sure of the amount, time, and type of specimen to be collected
- E. Complete requisitions accurately
- F. Label specimen properly with:
  1. Patient's name
  2. Location
  3. Type specimen
  4. Time
  5. Comments or observations, if any
- G. Wash hands thoroughly after collecting specimens

  (NOTE: Some specimens are very infectious. Observe careful medical asespis in handling specimens.)
- H. Carry or send specimen to laboratory immediately, or store in proper environment
- I. Record data on patient's chart:
  1. Time
  2. Type specimen
  3. Amount

4. Color

5. Any other significant gross observations

J. Report complications encountered to the person in charge

III. Five types of urine specimens

A. Routine urine specimen

B. Midstream (clean catch)

C. Twenty-four hour continuous

D. Twenty-four hour fractional

E. Catheterized

IV. Collecting procedure for the five types of urine specimens

A. Routine urine specimen

1. May be collected upon admission

2. The genital area of a female patient is usually cleaned immediately before obtaining the specimen because of the possible presence of bacteria around the urethra

3. Usually the first voided specimen of the day is collected as a routine specimen

B. Midstream (clean catch)

1. Clean or instruct patient to clean urethral area thoroughly

2. Patient begins to void into toilet thus rinsing the urethra

3. Place midstream urine into the container

4. The remaining urine is voided into the toilet

C. Twenty-four hour continuous specimen--entire quantity of urine voided for twenty-four hours is collected and sent to the laboratory as a single specimen

1. Label container for storing the urine and place in refrigerator as instructed

2. At a given starting time, usually 8:00 a.m., have patient void. Discard this urine

3. Collect all urine voided during twenty-four hour period and place in labeled containers

4. Twenty-fours after the first specimen, the final specimen is collected

5. The total amount of urine for the twenty-four hour period is sent to the laboratory with proper instructions

D. Twenty-four, fractional

1. Specimens are collected at a certain period of time

2. Each storage container is labeled to show the time in which the collective specimens were obtained

3. The first specimen is obtained and discarded; all specimens are then saved, up to and including the one at the end of the designated time period

4. The second time period begins with the next specimen taken and ends with the specimen taken at the end of the time period. This procedure is repeated as many times as doctor orders it

5. All collected urine for each time period is sent to the laboratory at the end of the time period. (Note: Not at the end of the twenty-four hour period)

E. Catheterized--Specimen obtained aseptically, using a catheter

V. Uses of various types of urine specimens in diagnosis

A. Routine urine specimen

1. To aid in determining the progress or diagnosis of a disease

2. To aid in the determination of cardiac/kidney function

B. Midstream catch--may be used to determine the presence of microorganisms or foreign substances

C. Twenty-four hour, continuous--may be used to determine the kinds and amounts of wastes the kidneys excrete

D. Twenty-four hours, fractional--used in diagnosis and control of diabetes

E. Catheterized--usually used for bacterial culture and to test bacteria for sensitivity to antibiotics

VI. Stools and feces specimens

A. Stool specimens may aid in determining digestive functions. Stools are also examined for parasites and eggs, blood, tissue, and pus.

B. The individual securing the specimen must know what test is to be done. The type of test to be done determines the manner in which the specimen is to be collected and prepared.

C. All specimens must be labeled accurately so the laboratory personnel will know exactly what test is to be done.

D. Stool specimens should be sent to the laboratory as soon as they are collected or should be stored in the proper place.

VII. Gastric specimens

A. A tube from the patient's mouth to the stomach is used to obtain a specimen of gastric juices.

B. Vomitus may be used as a source of gastric contents for laboratory examination.

C. Gastric specimens may be examined for blood, bacteria, feces, undigested foods, and to determine the presence of hydrochloric acid.

VIII. Sputum specimens

A. Sputum specimens are used to aid in the diagnosis of respiratory disease.

B. Before securing the specimen, the mouth should be rinsed with water to avoid contamination with food particles.

C. The usual time to collect a sputum specimen is just after a patient has awakened in the morning.

D. The patient is instructed to cough deeply for several minutes and then spit into the collection container.

UNIT XII-A

COLLECTING SPECIMENS

ASSIGNMENT SHEET #1--COLLECTING SPECIMENS

Directions: Underline the correct answer after each statement.

1. A specimen is a small sample or part taken to show the nature of the whole.

   yes   no

2. To make an object unsterile or unclean by contact is called contamination.

   yes   no

3. Procedure for collecting specimens:

   a. Follow the procedure or policies of the institution.

      yes   no

   b. Never identify and greet patient. It is not necessary to explain procedure to patient.

      yes   no

   c. Make certain of the amount, time, and type of specimen to be collected.

      yes   no

   d. Complete requisitions correctly.

      yes   no

   e. It is not necessary to label all specimens because the specimens from some patients are easily identified.

      yes   no

4. Hands should be thoroughly washed after the collection of every specimen.

yes no

5. We have studied four types of urine specimens.

yes no

6. The difference between a twenty-four hour urine specimen and a twenty-four hour fractional urine specimen is that one specimen contains a fraction more than the other.

yes no

7. A urine specimen which is caught in the middle of the urination process is called a mid-stream catch.

yes no

8. Gastric juices are taken from the stomach.

yes no

9. Sputum examinations are used mainly to aid in diagnosing respiratory disease.

yes no

10. The best time to collect a sputum specimen is in the morning as soon as the patient awakens.

yes no

UNIT XII-A

COLLECTING SPECIMENS

ANSWERS TO ASSIGNMENT SHEET

Assignment Sheet #1

1. yes
2. yes
3. a. yes
   b. no
   c. yes
   d. yes
   e. no
4. yes
5. no
6. no
7. yes
8. yes
9. yes
10. yes

UNIT XII-A

COLLECTING SPECIMENS

JOB SHEET #1--COLLECT A ROUTINE URINE SPECIMEN

I. Equipment required:

  A. Label

  B. Container and cover for specimen

  C. Laboratory requisition slip properly filled out

  D. Bedpan or urinal and cover

  E. Graduate

II. Procedures:

  A. Wash hands

  B. Identify patient

  C. Greet patient, explain procedure,and give instructions

  D. Provide privacy

  E. Offer bedpan/urinal

  F. After the patient voids, take the bedpan or urinal to designated area

  G. Pour urine into a graduate

  H. Pour at least four ounces or 120cc into the specimen container

  I. Clean bedpan/urinal and return to designated area

  J. Wash hands

  K. Provide for patient's comfort

  L. Cover container. Attach label and requisition slip to container

  M. Take or send specimen to laboratory

  N. Record or chart procedure and observations

UNIT XII-A

COLLECTING SPECIMENS

JOB SHEET #2--COLLECT A MIDSTREAM CLEAN CATCH URINE SPECIMEN

I. Equipment required:

   A. Label

   B. Sterile container with cover

   C. Laboratory requisition slip properly filled out

   D. Cleaning agent

   E. Cotton balls

   F. Water

   G. Sterile gloves

II. Procedures for female patient (ambulatory):

   A. Wash hands

   B. Identify patient

   C. Greet patient and explain procedure

   D. Instruct patient in procedure

      1. Hold sides of vulva with thumb and index finger, cleanse area from front to back using one cotton ball for each stroke

      2. Repeat procedure two more times, once on each side, and once down the center over urinary meatus

      3. Begin voiding, allowing first of the stream to flow into toilet

      4. Catch only the midstream urine in the sterile specimen container

      5. Void the remainder of the urine into the toilet

6. Cover specimen container. (Note: If a commercial kit is used, follow manufacturer's instructions)

III. Procedures for female (bed patient)

A. Complete label and requisition slip properly

B. Wash hands

C. Assemble equipment and take to bedside

D. Identify patient and explain procedure

E. Provide patient privacy

F. Drape the patient with a cover

G. Place patient on the bedpan

H. Place equipment on patient's bed

I. Wash hands

J. Put on gloves

K. Clean the vulva (Note: Follow same procedure entirely in cleaning the female genitalia as given in the instructions for the ambulatory patient. The operation is similar except the patient is placed on the bedpan and assisted as needed by the nurse.)

UNIT XII-A

COLLECTING SPECIMENS

JOB SHEET #3--COLLECT A TWENTY-FOUR HOUR URINE SPECIMEN

I. Equipment required:

  A. One-gallon bottle with label attached

  B. Laboratory requisition slip, properly filled out

  C. Bedpan/urinal and cover

  D. Container and cover for specimen

  E. Graduate

II. Procedures:

  A. Wash hands

  B. Greet patient, explain procedure, and give instructions

  C. Obtain storage container from laboratory and label

  D. Place container in designated area

  E. At starting time have patient void. Discard this urine

  F. Collect all urine voided during twenty-four hour period in labeled container

  G. Have patient void at the end of the twenty-four hour period and add this urine to amount already collected

  H. Measure all urine in the container and record this amount on label

  I. Send or take entire amount to laboratory unless otherwise ordered

  J. Wash hands

  K. Do not contaminate outside of container

L. Cover container and attach requisition slip and label

M. Clean and replace equipment

N. Record or chart the procedure

(Note: Follow these directions for a cumulative or fractional twenty-four hour specimen. If the urine is to be collected for three or four time periods during the twenty-four hour period, the first specimen is discarded; all other specimens including the one at the end of the time period are saved. At the end of each period, the collected urine is labeled, the proper requisition is attached, and the specimen is sent to the laboratory.)

UNIT XII-A

COLLECTING SPECIMENS

JOB SHEET #4--COLLECT A STOOL OR FECES SPECIMEN

I. Equipment required:

- A. Label
- B. Bedpan or commode
- C. Toilet tissue
- D. Tongue blades
- E. Specimen container and cover
- F. Laboratory requisition

II. Procedures:

- A. Check patient's chart for orders for specific instructions for collecting the specimen.
- B. Complete requisition and label for container
- C. Explain the procedure to the patient and instruct him/her to use the bedpan or commode to obtain specimen.

  (Note: In some cases a disposable container may be used; it may be placed in the toilet just under the toilet seat.)
- D. Use tongue blades to remove the specimen from the bedpan and place in specimen container. (Amount required depends on examination to be done) Cover container.
- E. Wash hands
- F. Clean and replace equipment
- G. Label and take/send specimen to laboratory promptly
- H. Record or chart the procedure

UNIT XII-A

COLLECTING SPECIMENS

JOB SHEET #5--COLLECT A SPUTUM SPECIMEN

I. Equipment required:

   A. Container and cover for specimen

   B. Tissues

   C. Label

   D. Glass of water

   E. Emesis basin

   F. Laboratory requisition

II. Procedures:

   A. Identify patient, explain procedure, give instructions

   B. Fill out label on container and requisition

   C. Wash hands

   D. Have patient rinse mouth to remove food particles

   E. Advise patient to cough; very deep mucus from the lungs is needed, not mouth secretions

   F. Place sputum in container and cover at once

   (Note: If a twenty-four hour specimen has been ordered, leave container and cover at the bedside)

   G. Wash and dry the outside of container

   H. Wash hands

   I. Take/send specimen to laboratory

   J. Clean and replace equipment

   K. Record or chart the procedure

   L. Report any unusual observations to the supervisor

UNIT XII-A

COLLECTING SPECIMENS

UNIT TEST

1. Match the numbered terms on the right with the correct definition.

_____a. Written request for a test or a service

_____b. Free of all living organisms, germ-free

_____c. Fluid waste filtered from the blood by the kidney

_____d. External parts of the female reproductive system that surround the opening of the vagina and urethra

_____e. Yellow-green fluid secreted by the liver, sometimes present in vomitus

_____f. Presence of blood in the urine

_____g. Painful urination

_____h. To empty the urinary bladder

_____i. To grow microorganisms on laboratory culture media

_____j. Tubular instrument used to drain or inject fluids through a body passage

_____k. Presence of glucose in the urine

1. Bile
2. Catheter
3. Contaminate
4. Culture
5. Dysuria
6. Glycosuria
7. Hematuria
8. Meatus
9. Parasite
10. Requisition
11. Specimen
12. Sputum
13. Sterile
14. Stool
15. Urethra
16. Urine
17. Void
18. Vomit
19. Vulva

_____l. An organism that lives on or in another organism

_____m. To eject the contents of the stomach through the mouth

_____n. Small sample or part intended to show the kind and quality of the whole

_____o. To make unsterile or unclean by contact

_____p. An opening or passage in the body

_____q. Thick discharge from lungs and throat

_____r. Waste product of digestion eliminated through the anus

_____s. Tube leading from the urinary bladder to the exterior of the body

2. Describe the general procedures for collecting specimens.

   a.

   b.

   c.

   d.

   e.

   f.

      (1)

      (2)

(3)

(4)

(5)

g.

h.

i.

(1)

(2)

(3)

(4)

(5)

j.

3. List the five types of urine specimens.

a.

d.

b.

e.

c.

4. Answer the following questions about procedures for collecting urine specimens.

a. Which type of urine specimen is usually collected upon admission? ____________a.

b. At what time is the collection of twenty-four hour urine specimen usually begun? ____________b.

c. What part of a twenty-four hour urine specimen is sent to the laboratory? ____________c.

d. Which type urine specimen is aseptically obtained? ____________d.

e. A midstream urine specimen is also called a ____________e.

5. Give the type of urine specimen used in the following diagnostic tests.

a. To determine the progress or diagnosis of a disease ____________a.

b. To determine the presence of mircoorganisms or foreign substances ____________b.

c. To determine the kinds and amounts of wastes the kidneys excrete ____________c.

d. Diagnosis and control of diabetes ____________d.

e. Used for bacterial culture and sensitivity to antibiotics ____________e.

6. Discuss the collection of a stool or feces specimen.

7. Discuss the collection of a gastric specimen.

8. Explain the procedures for collecting a sputum specimen.

UNIT XII-A

COLLECTING SPECIMENS

ANSWERS TO UNIT TEST

1. a. 10
   b. 13
   c. 16
   d. 19
   e. 1
   f. 7
   g. 5
   h. 17
   i. 4
   j. 2
   k. 6
   l. 9
   m. 18
   n. 11
   o. 3
   p. 8
   q. 12
   r. 14
   s. 15

2. General procedures for collecting specimens:
   a. Follow the procedures or policies of the institution
   b. Identify and greet patient
   c. Explain procedure to patient
   d. Make sure of the amount, time, and type of specimen to be collected
   e. Complete requisitions accurately
   f. Label specimen properly with:
      (1) patient's name
      (2) location
      (3) type of specimen
      (4) time
      (5) comments or observations, if any
   g. Wash hands thoroughly after collecting specimens
   h. Carry or send specimen to laboratory immediately or store in proper environment
   i. Record data on patient's chart
      (1) time
      (2) type specimen
      (3) amount
      (4) color
      (5) any other significant gross observations

3. The five types of urine specimens:
    a. routine urine specimen
    b. midstream catch specimen
    c. twenty-four hour continuous specimen
    d. twenty-four hour fractional specimen
    e. catheterized specimen
4. a. routine
    b. 8:00 a.m.
    c. all of it
    d. catheterized
    e. clean catch
5. a. routine
    b. midstream catch
    c. twenty-four hour, continuous
    d. twenty-four hour, fractional
    e. catheterized
6. Discussion should include:
    a. Stool specimens may aid in determining digestive function. Stools are also examined for parasites and eggs, blood, tissue, and pus.
    b. The type of test to be done will determine the manner in which the specimen is to be collected and prepared.
    c. Label all specimens accurately so the laboratory personnel will know exactly what test is to be done.
    d. Stool specimens should be sent to the laboratory as soon as they are collected or should be stored in the proper place.
7. Discussion should include:
    a. A tube from the patient's mouth to the stomach is

used to obtain a specimen of gastric juices.

b. Vomitus as a source of gastric contents may be examined by the laboratory.

c. Gastric specimens may be examined for blood, bacteria, feces, undigested foods, and to determine the presence of hydrochloric acid.

8. Explanation should include:

    a. Sputum may be used to aid in the diagnosis of respiratory disease.

    b. Before securing the specimen, the mouth should be rinsed with water to avoid presence of food particles in the specimen.

    c. The usual time to collect a sputum specimen is just after a patient has awakened in the morning.

    d. The patient is instructed to cough deeply for several minutes and then spit into the collection container.

9. Evaluated to the satisfaction of the instructor

UNIT XII

ASSISTING WITH DIAGNOSTIC PROCEDURES

SECTION B--POSITIONING AND DRAPING THE PATIENT FOR THE MEDICAL EXAMINATION

UNIT OBJECTIVE

After completing this unit, the student will be able to identify equipment, discuss procedures, and perform techniques relating to positioning and draping a patient for the medical examination. This knowledge will be evidenced through demonstration and by satisfactorily completing a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Identify basic instruments used in giving a medical examination.
2. Explain procedures for assisting the physican with the medical examination.
3. Identify body positions for the medical examination.
4. Explain procedures for draping the patient for the medical examination.
5. Demonstrate the ability to:
    a. Position a patient for an examination
    b. Drape a patient for an examination
    c. Set up a tray for examination equipment

UNIT XII-B

POSITIONING AND DRAPING THE PATIENT FOR THE MEDICAL EXAMINATION

SUGGESTED ACTIVITIES

I. Instructor

  A. Provide objective sheet

  B. Discuss objective sheet

  C. Pass out information sheet

  D. Discuss information sheet

  E. Make and show transparencies

  F. Distribute and discuss assignment sheets

  G. Demonstrate procedures outlined in information sheets

  H. Give and evaluate test

II. Student

  A. Read and discuss objective sheet

  B. Read and discuss material contained in information sheet

  C. Complete assignment sheets

  D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

  B. Information sheets

C. Transparency masters

  1. XII-B-TM-1--Basic Equipment for Medical Examination

  2. XII-B-TM-2--Positioning and Draping the Patient

  3. XII-B-TM-3--Positioning and Draping the Patient

D. Assignment sheets

  1. Assignment Sheet #1--Practice in Positioning and Draping a Patient

  2. Assignment Sheet #2--Identifying Basic Examination Instruments

E. Answers to assignment sheets

F. Unit test

G. Answers to unit test

II. References: Books

A. Atkinson, Betty. The Medical Assistant. Albany, New York: Delmar Publishers, 1976.

B. Bredow, Miriam, and Marion G. Cooper. The Medical Assistant. 3rd ed. St. Louis, Missouri: McGraw-Hill Book Co., 1958.

C. Caldwell, Esther, and Barbara Hegner. The Health Assistant. Albany, New York: Delmar Publishers, 1973.

UNIT XII-B

POSITIONING AND DRAPING THE PATIENT FOR THE MEDICAL EXAMINATION

INFORMATION SHEET

I. Basic equipment for the medical examination:

   A. Flashlight
   B. Gloves
   C. Percussion hammer
   D. Tongue depressor
   E. Cotton ball in antiseptic solution
   F. Emesis basin (lined with paper towel)
   G. Tissue
   H. Lubricant
   I. Tape measure
   J. Nasal speculum
   K. Otoscope
   L. Ophthalmoscope
   M. Blood pressure cuff
   N. Stethoscope

   (Note: See XII-B-TM-1)

II. Procedures for assisting the physician with the examination:

   A. Assemble basic equipment
   B. Remain in the room unless otherwise instructed
   C. Assist the patient to prepare appropriately for examination as sitting up in bed, undressing, or turning
   D. Follow the medical facility's general rules on examination
   E. Stand by to help position or hold the patient as the doctor requests
   F. Put used equipment in proper place
   G. Report time, date, and the extent of the examination for charting

III. Patient positions for medical examination

- A. Vertical--Standing upright, with good posture and arms at ease by the sides
- B. Dangling--Sitting on the side of bed, with feet hanging
- C. Horizontal recumbent--Lying flat on the back without a pillow and the knees slightly apart
- D. Supine--Outstretched on the back
- E. Dorsal recumbent--Lying on the back with one pillow under the head and with the knees flexed (bent) and separated
- F. Prone--Lying face down with the head turned to one side
- G. Fowler's--Head and back elevated to quite a high angle on the bed and the knees flexed
- H. Semi-Fowler's--Head and back somewhat elevated and the knees flexed slightly
- I. Knee-chest position--Resting on chest and knees, face down, thighs perpendicular to bed, buttocks elevated
- J. Sim's--Lying on the left side with left arm behind the back and the right leg drawn up and apart from the left
- K. Lithotomy--Lying on the back with the legs separated and the thighs at right angles to the hips
- L. Trendelenberg's--Lying on the back on a special table, so that the head, trunk, and thighs are on a headfirst slant and the knees are flexed or hanging over the edge of the table

IV. Procedures for draping a patient

- A. Greet the patient
- B. Explain procedure
- C. Remove gown or clothing
- D. Cover the patient or give the patient the correct clothing to put on

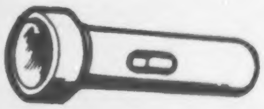
E. The only area of the patient's body that is to be exposed is the area that is to be examined

F. The patient should never be left uncovered or alone in the room

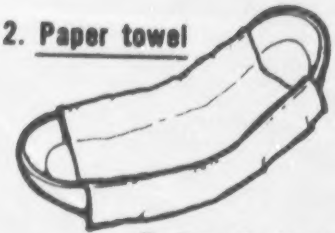
G. The basic examination position is the dorsal recumbent position (see XII-B-TM-2)

H. The procedure for draping a patient will vary with the examination to be done

BASIC EQUIPMENT FOR MEDICAL EXAMINATION

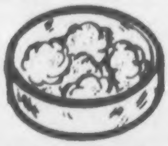


1. Flashlight



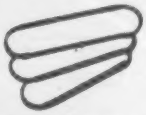
2. Paper towel

7. Emesis basin

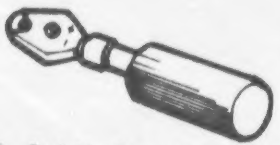


3. Antiseptic solution

4. Cotton balls

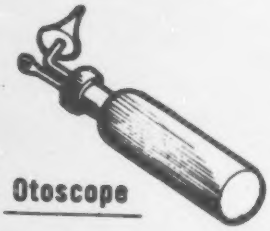


5. Tongue depressors

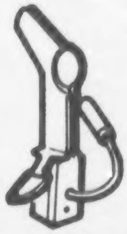


6. Ophthalmoscope

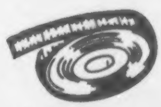
8. Tissues



9. Otoscope

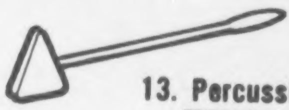


10. Nasal speculum



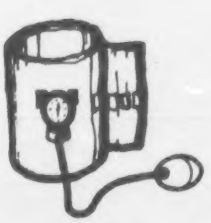
11. Tape measure

12. Lubricant

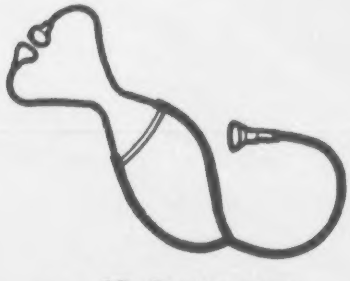


13. Percussion hammer

14. Gloves

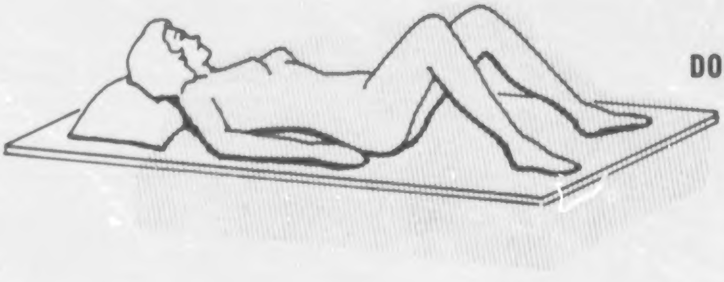


15. Blood pressure cuff

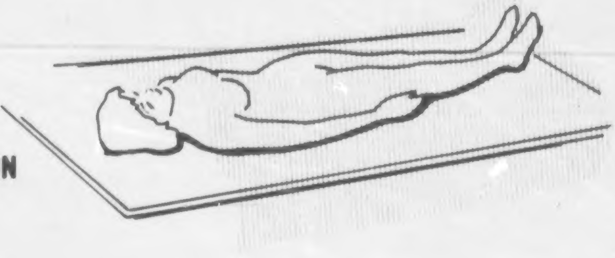


16. Stethoscope

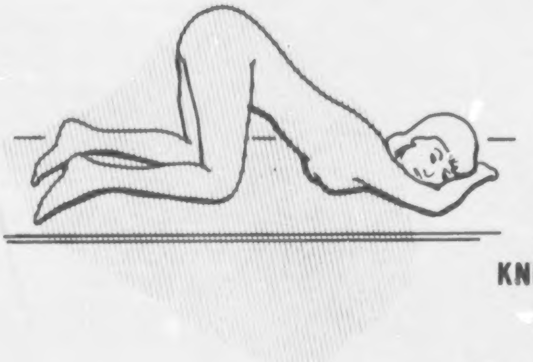
POSITIONING AND DRAPING THE PATIENT



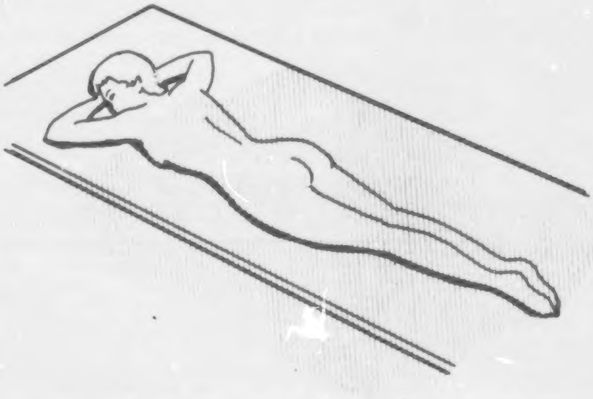
DORSAL RECUMBENT POSITION



HORIZONTAL RECUMBENT POSITION

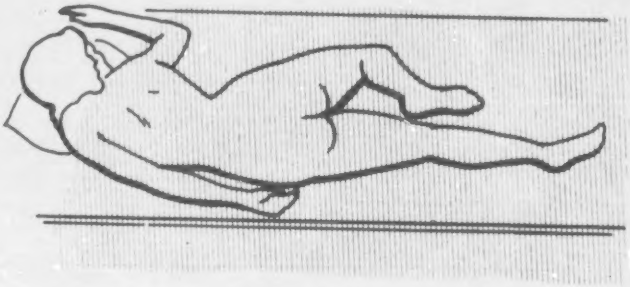


KNEE CHEST POSITION

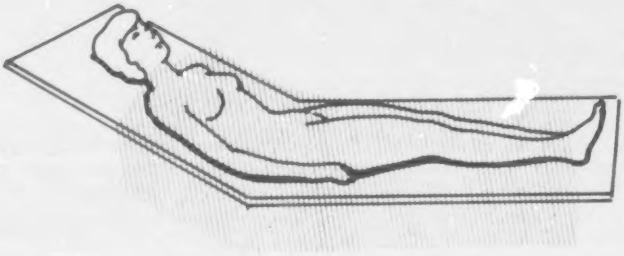


PRONE POSITION

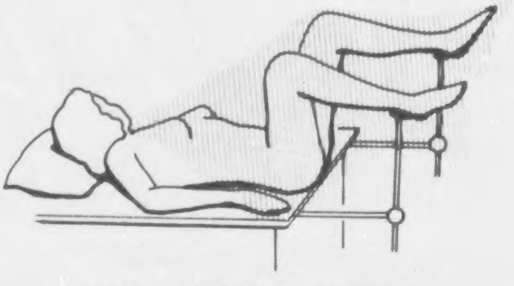
POSITIONING AND DRAPING THE PATIENT



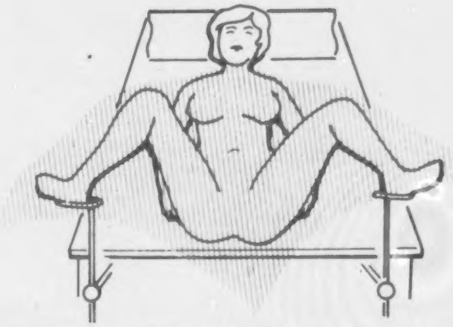
SIM'S POSITIONS



FOWLER'S POSITION



SEMI- FOWLER'S POSITION



DORSAL LITHOTOMY POSITION

UNIT XII-B

POSITIONING AND DRAPING THE PATIENT FOR THE MEDICAL EXAMINATION

ASSIGNMENT SHEET #1--PRACTICE IN POSITIONING AND DRAPING A PATIENT

Directions: In a role-playing situation, use your classmate as a model and place the person in the following positions. Drape accordingly.

A. Horizontal recumbent position

B. Prone position

C. Vertical position

D. Dangling position

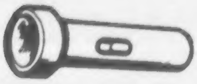
E. Supine position

UNIT XII-B

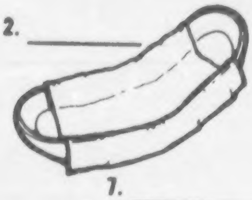
POSITIONING AND DRAPING THE PATIENT FOR THE MEDICAL EXAMINATION

ASSIGNMENT SHEET #2--IDENTIFYING BASIC EQUIPMENT FOR MEDICAL EXAMINATION

Directions: From the picture below, identify the basic examination instruments used in a medical examination.

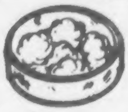


1. ________



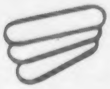
2. ________

7. ________

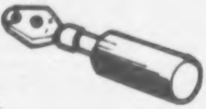


3. ________

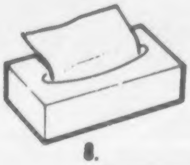
4. ________



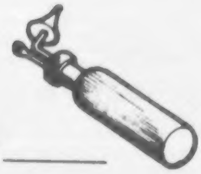
5. ________



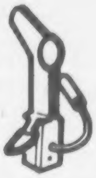
6. ________



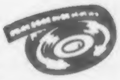
8. ________



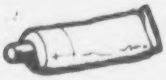
9. ________



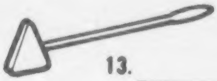
10. ________



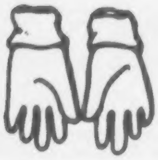
11. ________



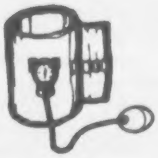
12. ________



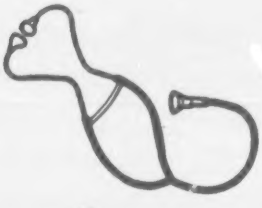
13. ________



14. ________



15. ________



16. ________

UNIT XII-B

POSITIONING AND DRAPING THE PATIENT FOR THE MEDICAL EXAMINATION

ANSWERS TO ASSIGNMENT SHEET

Assignment Sheet #1

Evaluated to the satisfaction of the instructor.

Assignment Sheet #2

1. Flashlight
2. Paper towel
3. Antiseptic solution
4. Cotton balls
5. Tongue depressor
6. Ophthalmoscope
7. Emesis basin
8. Tissue
9. Otoscope
10. Nasal speculum
11. Tape measure
12. Lubricant
13. Percussion hammer
14. Gloves
15. Blood pressure cuff
16. Stethoscope

UNIT XII-B

POSITIONING AND DRAPING THE PATIENT FOR THE MEDICAL EXAMINATION

UNIT TEST

1. List 14 items of basic equipment that may be used in a medical examination.

a.	h.
b.	i.
c.	j.
d.	k.
e.	l.
f.	m.
g.	n.

2. Answer each statement by writing TRUE or FALSE in the blanks at the left.

_____a. Assemble instruments needed for the examination

_____b. Be present in the room unless otherwise instructed

_____c. Assist patient only if it is necessary

_____d. Follow the general rules on examination of the medical facility

_____e. Stand by to help position or hold the patient as the doctor requests _____f. All used or soiled equipment must be placed in the proper place according to the policies of the medical facility

_____g. Report time, date, and the extent of the examination for charting

3. Match the terms on the right with the definitions on the left in relation with positioning the patient.

_____a. The patient lies face down with head turned to one side

_____b. Resting on chest and knees, face down, thighs perpendicular to bed, buttocks elevated

_____c. Standing upright with good posture and arms at ease by the sides

_____d. Lying flat on the back without a pillow and the knees slightly apart

_____e. Outstretched on the back

_____f. Lying on the back with one pillow under the head and with the knees flexed (bent) and separated

_____g. Lying on the left side with left arm behind the back and right leg drawn up and apart from the left

_____h. Lying with the head and back elevated to quite a high angle on the bed and the knees flexed

_____i. Lying with the head and back somewhat elevated and the knees flexed slightly

_____j. Sitting on the side of the bed with the feet hanging

1. Horizontal recumbent
2. Prone
3. Sim's
4. Supine
5. Dorsal recumbent
6. Knee-chest
7. Fowler's
8. Dangling
9. Vertical
10. Semi-Fowler's

4. Complete the following statements concerning positioning the patient

   a. The arrangement of a sheet over a patient to prevent embarrassment but still allow the doctor to examine the patient is known as ____________________.

   b. The assistant should greet the patient and explain ____________________.

   c. The only area of the patient's body that is to be exposed is the area that is to be ______________.

   d. The basic examination position is the __________ position.

   e. The procedure for draping a patient will ________ with the type of examination to be done.

5. Demonstrate the ability to:

   a. Position a patient for an examination

   b. Drape the patient for an examination

   c. Set up a tray of examination equipment

(NOTE: If specific objective #5, has not been completed prior to test, ask the instructor when it should be completed.)

UNIT XII-B

POSITIONING AND DRAPING THE PATIENT FOR THE MEDICAL EXAMINATION

ANSWERS TO UNIT TEST

1. List should include 14 of the following:
    - a. flashlight
    - b. gloves
    - c. percussion hammer
    - d. tongue depressor
    - e. cotton ball in antiseptic solution
    - f. emesis basin
    - g. tissue
    - h. lubricant
    - i. tape measure
    - j. nasal speculum
    - k. otoscope
    - l. ophthalmoscope
    - m. blood pressure cuff
    - n. stethoscope
2.
    - a. True
    - b. True
    - c. False
    - d. True
    - e. True
    - f. True
    - g. True
3.
    - 2 a.
    - 6 b.
    - 9 c.
    - 1 d.
    - 4 e.
    - 5 f.
    - 3 g.
    - 7 h.
    - 10 i.
    - 8 j.
4.
    - a. draping
    - b. procedure
    - c. examined
    - d. dorsal recumbent position
    - e. vary
5. Evaluated to the satisfaction of the instructor.

UNIT XIII

TRANSPORTING PATIENTS

TERMINAL OBJECTIVE

After completing this unit, the student will be able to describe, identify, and discuss terms, procedures, and factors relating to moving, lifting, and transferring patients. The student will assist a patient in walking, assist a patient to stand as well as assist a patient to use crutches. This knowledge will be evidenced through demonstration and by satisfactorily completing a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Match terms and definitions relating to moving, lifting, and transferring patients.
2. Discuss rules for body mechanics.
3. List at least ten ways exercise promotes the functioning of the patient's body.
4. List types of activity or exercise for patients.
5. Discuss the development of contractures.
6. List the key points about body mechanics.
7. Identify body positions.
8. Demonstrate the ability to:
    a. Transfer a patient in and out of bed.
    b. Assist patient to walk.
    c. Assist patient into a wheelchair.
    d. Assist patient to stand.
    e. Assist patient to use crutches.
    f. Put patient on a stretcher.
    g. Turn a patient on side.
    h. Accompany a patient to another department.

UNIT XIII

TRANSPORTING PATIENTS

SUGGESTED ACTIVITIES

I. Instructor

   A. Provide objectives sheet.

   B. Discuss objectives sheet.

   C. Pass out and discuss information sheet.

   D. Show film and film strips.

   E. Make and show transparencies.

   F. Distribute and discuss assignment and job sheets.

   G. Demonstrate procedures outlined in job sheets.

   H. Give test and evaluate result.

II. Student

   A. Read and discuss objectives sheet.

   B. Participate in discussion of objectives sheet.

   C. Read and discuss material contained in information sheet.

   D. Complete assignment sheets.

   E. Demonstrate proficiency in performing procedures.

   F. Review film.

   G. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objectives sheet

   B. Information sheet

C. Transparency masters
  1. XIII-TM-1--Patient Position
  2. XIII-TM-2--Patient Position
  3. XIII-TM-3--Patient Position

D. Assignment sheet
  1. Assignment Sheet #1--Identification of Body Position

E. Answer to assignment sheet

F. Job sheets
  1. Job Sheet #1--Transfer a Patient In and Out of Bed
  2. Job Sheet #2--Assist Patient to Walk
  3. Job Sheet #3--Assist Patient into a Wheelchair
  4. Job Sheet #4--Assist Patient to Stand
  5. Job Sheet #5--Assist a Patient to Use Crutches
  6. Job Sheet #6--Put Patient on a Stretcher
  7. Job Sheet #7--Turn the Patient on Side
  8. Job Sheet #8--Accompany a Patient to Other Departments

G. Test

H. Answers to test

II. References

A. Books:

1. Caldwell, Esther and Barbara R. Hegner. Geriatrics: A Study of Maturity. Albany, New York: Delmar Publishers, 1975.
2. Caldwell, Esther and Barbara R. Hegner. Health Assistant. Albany, New York: Delmar Publishers, 1973, pp. 38-43.

3. Grimes, L. A., ed. Supervised Study Guides for Physical Therapy Aides. Austin, Texas: Instructional Materials Services, Division of Extension, The University of Texas at Austin, 1971.

4. Hornemann, Grace V. Basic Nursing Procedures. Albany, New York: Delmar Publishers, 1966, pp. 91-110.

5. Hospital Research and Educational Trust, Being A Nursing Aide. Bowie, Maryland: Robert J. Brady Co., 1969.

6. Reese, Dorothy. How to be a Nurse's Aide in a Nursing Home. American Health Care Association 1975, pp. 39-40, 76-85. (Address of American Health Care Association, 1200 15th N.W., Washington, D.C. 20051).

7. Stolten, Jane Henry. The Health Aide. Boston, Massachusetts: Little, Brown, and Co., 1972, pp. 73-74, and 112.

8. Story, Donna K. Principles and Practices of Nursing Care. Dallas, Texas: McGraw-Hill Book Company, 1976, p. 220.

9. Thompson, Ella M. and Constance Murphy. Textbook of Basic Nursing. Philadelphia, Pennsylvania: J. B. Lippincott Co., 1966, pp. 285-287, 289, and 454-458.

B. Films

1. Orientation to the Use of Crutches. Texas Department of Health Resources.

C. Film Strips

1. "Positioning The Patient for Comfort and Safety,"#477. Trainex Corporation, P.O. Box 116. Garden Grove, California 92642.

2. "Moving the Sick and Injured", 395. Trainex Corporation. P.O. Box 116. Garden Grove, California 92642.

UNIT XIII

TRANSPORTING PATIENTS

INFORMATION SHEET

I. Definition of terms

A. Body mechanics--The way the body functions while you are standing, moving, and doing any job requiring physical effort. (The use of correct body mechanics helps to prevent injury to your body.)

B. Pivot--To turn the body by moving the feet rather than by twisting at the waist or hips

C. Squat--To move closer to the floor from a standing position by bending the knees and hips and keeping the back straight

D. Flex--To bend

E. Center of gravity--Point around which all parts of the body exactly balance each other

F. Posture--Position of the body which determines the distribution of weight and the pull on the joints and muscles

G. Muscle contracture--A condition that may occur in which muscles contract, thicken,and lose tone through lack of exercise

H. Alignment--Arrangement of the patient's body so that all parts are in proper positions in relation to each other

I. Dangle--To sit in a bed with feet off the bed moving in a free manner

J. Gait--A sequence of foot movement; a manner of walking

II. Rules of body mechanics

A. Encourage patients to do as much as they can for themselves whenever possible. This will provide exercise and maintain muscle tone. It will help prevent contracture.

B. Maintain a broad base of support by standing with feet comfortably apart, one foot forward and toes pointed in the direction of movement.

C. Stand close to your work and flex the knees and hips when stooping.

D. Use the longest and strongest muscles of the arms and legs to prevent back strain.

E. Carry heavy objects close to the body.

F. Move the patient by rolling or turning whenever possible rather than lifting.

G. Pull the patient toward you whenever possible because it is less taxing than rolling her/him away from you.

III. Ways that exercise promotes the functioning of the patient's body:

A. Stimulates appetite.

B. Stimulates circulation.

C. Stimulates bladder and bowel function.

D. Preserves strength

E. Tones the muscles

F. Helps prevent contractures

G. Relieves areas of pressure; aids in preventing decubitus ulcers

H. Hardens and strengthens bones

I. Helps maintain blood pressure

J. Aids in preventing thrombosis and hypostatic pneumonia

K. Reduces fatigue

IV. Types of activity or exercise for patients

A. Range-of-motion exercise

B. Muscle-conditioning exercise

  1. Isometric exercise

  2. Resistive exercise

C. Assisting patient to dangle

D. Getting patient up in wheelchair

E. Assisting patient to walk

F. Putting patient on a stretcher

G. Turning a patient over in bed

V. Development of contractures

A. Normal mobility depends upon the free movements of muscles and joints.

B. When muscle and joints are not used, the connective tissue fibers gradually become less pliable, a process called fibrosis.

C. Fibrosis restricts motion.

D. Fibrosis can lead to contracture and loss of mobility, if allowed to progress.

E. Contractures are very difficult to correct; treatment may require months or years of time or surgical correction.

F. Permanent deformity with contractures may occur in as short a time as three weeks.

G. Prevention of contractures is the best treatment.

VI. Key points about body mechanics

A. Do not lift anything or anyone if you can push or pull. Move your patient by rolling over rather than by lifting whenever possible.

B. Watch your feet. When lifting or moving equipment your feet should be apart. You will be better balanced and more stable.

C. Move close to what you want to move or lift. Do not reach. You will strain arm and shoulder muscles by reaching.

D. Hold object close. Keep elbows relaxed and hold the object close to the pelvic region of your body.

E. Squat. When close to the floor, keep your back straight, and bend your knees and your hips. Let your legs do the work, not your back.

F. Lift by straightening your legs. use the big, strong muscles in your legs, not the weak muscles in your back.

G. Pivot, do not twist, move your feet to turn, do not twist at the waist or hips.

H. Move smoothly and avoid jerky movement. Once you start to move, keep on going. Do not stop and start again. If a person is helping you, move together. It is a good idea to count, "1-2-3-4"!

VII. Body positions

A. Supine or horizontal recumbent--Patient lies on back with head and shoulders elevated slightly on the pillow. (TM-1)

B. Prone--Patient lies on abdomen with head turned to one side. (TM-1)

C. Lateral--Patient lies on side with both arms forward, knees and hips flexed. (TM-1)

D. Fowler's--Head of bed is elevated to forty-five degrees or more; knees are elevated as necessary to maintain position. (TM-2)

E. Dorsal recumbent--Patient lies on back with knees flexed. (TM-2)

F. Semi-prone or Sim's--Patient is between lateral and prone position with lower arm behind and upper arm flexed at shoulder and elbow; upper leg is flexed more than lower leg. (TM-2)

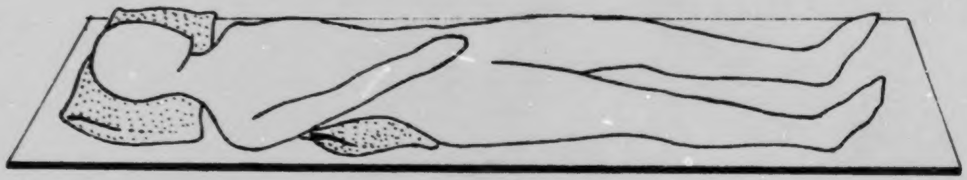
G. Trendelenburg--Patient lies on back with foot of the bed elevated on blocks at a forty-five degree angle. (TM-2)

H. Knee-chest--Patient kneels with buttocks upward, chest and head resting on bed. (TM-3)

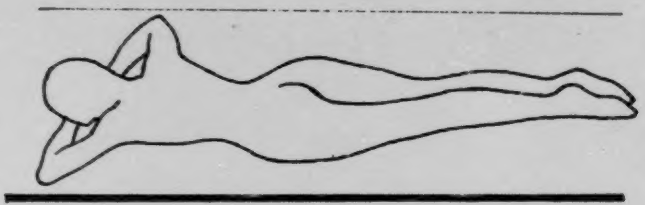
I. Lithotomy--Patient lies on back, hips flexed and slightly abducted; knees actively flexed; legs may be placed in leg holders or feet in stirrups. (TM-3)

J. Orthopneic--Patient sits with head and arms on a pillow on the overbed table, knees elevated for comfort. (TM-3)

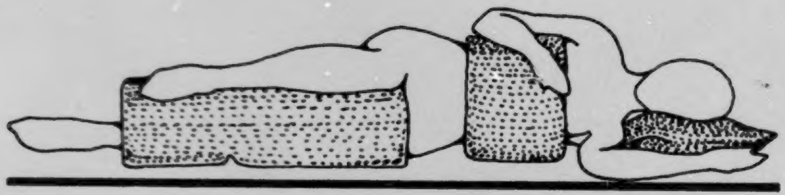
PATIENT POSITION



SUPINE

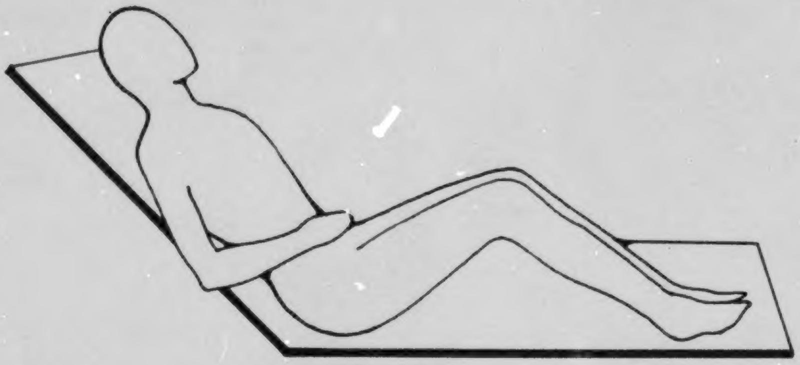


PRONE

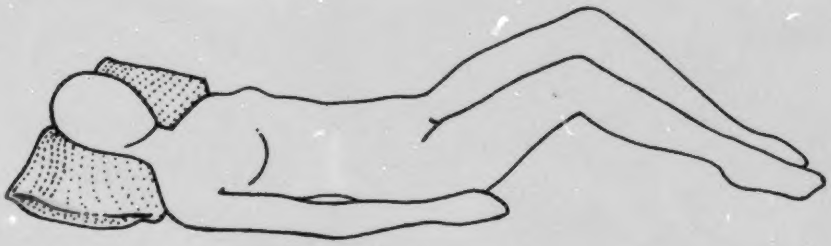


LATERAL

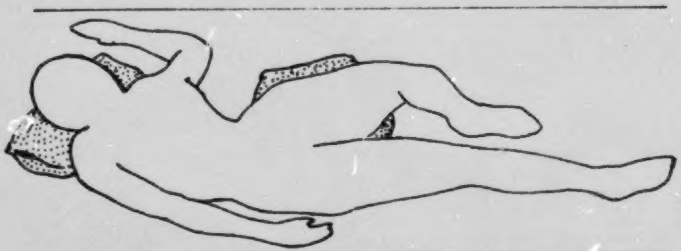
PATIENT POSITION



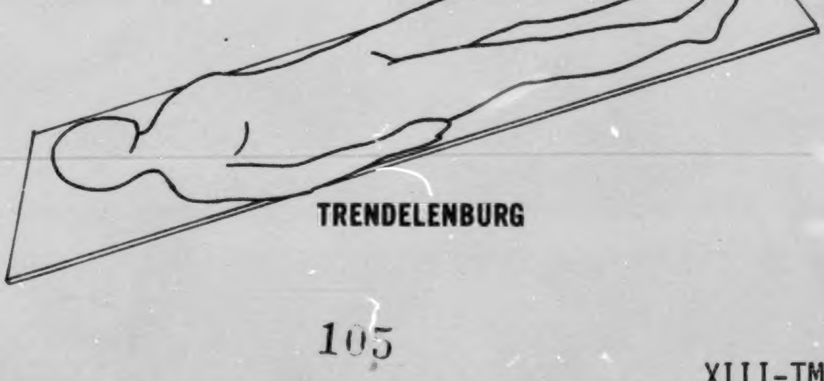
FOWLER'S



DORSAL RECUMBENT

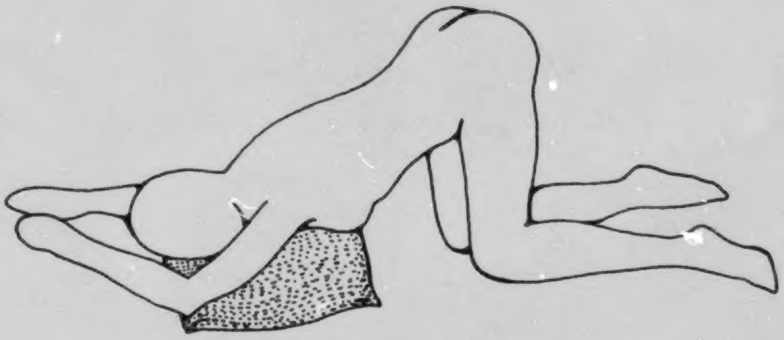


SIM'S

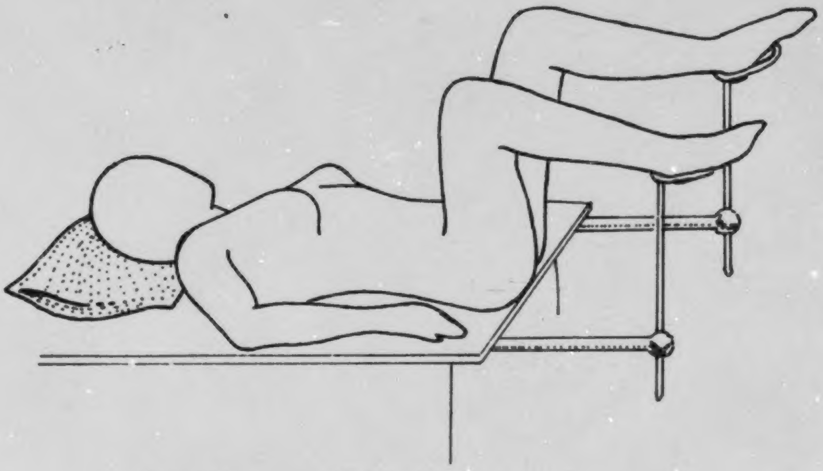


TRENDELENBURG

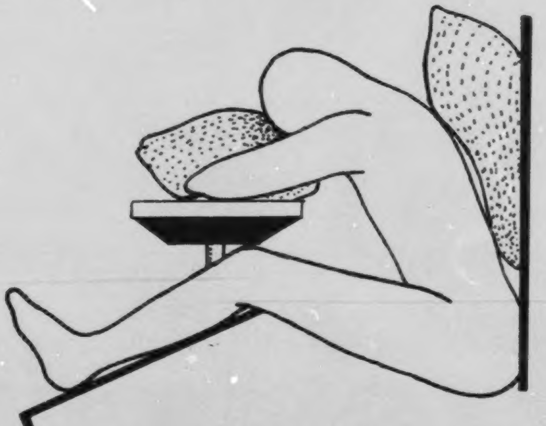
PATIENT POSITION



KNEE-CHEST



LITHOTOMY



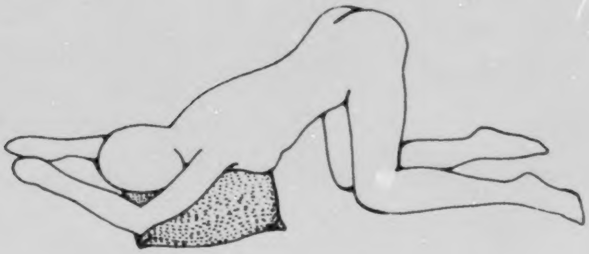
ORTHOPNEIC

UNIT XIII

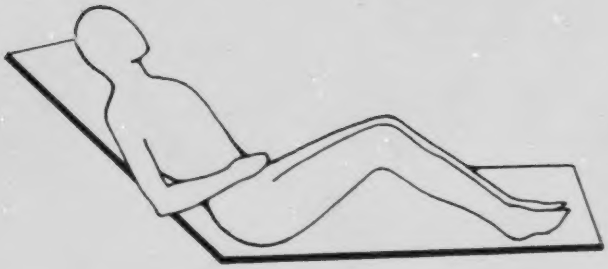
TRANSPORTING PATIENTS

ASSIGNMENT SHEET #1--IDENTIFICATION OF PATIENT POSITION

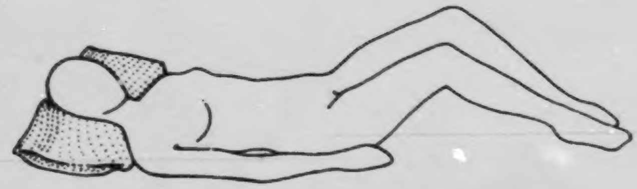
Directions: Label each position with the proper name.



1. ____________________

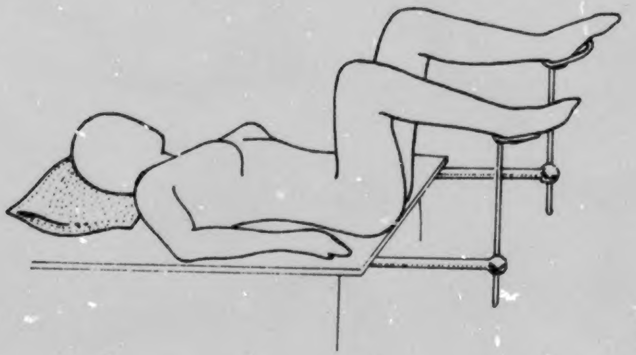


2. ____________________

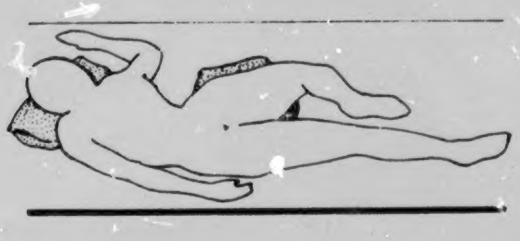


3. ____________________

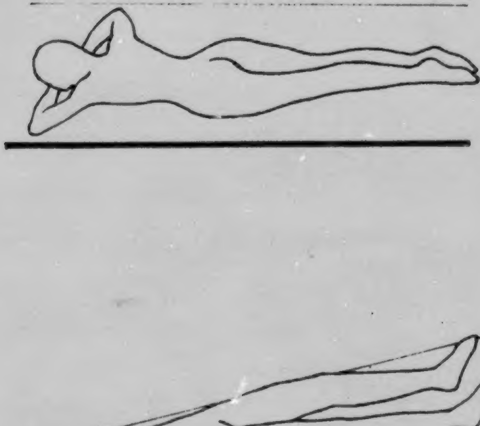
4. ______________________________



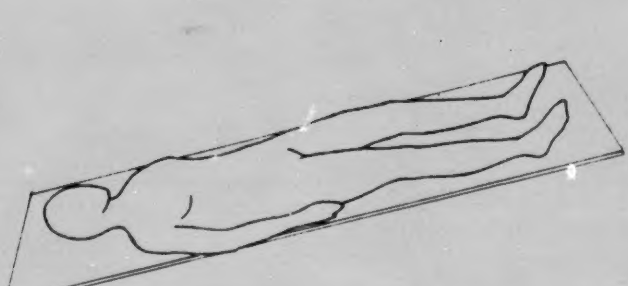
5. ______________________________

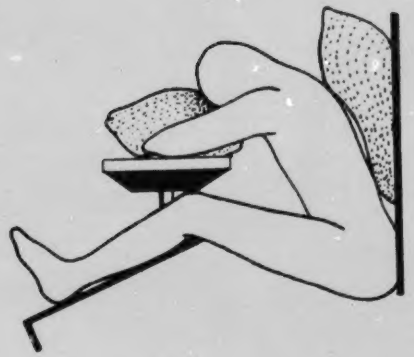


6. ______________________________

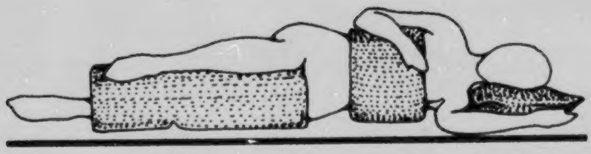


7. ______________________________

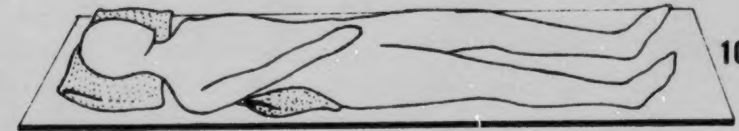




8. ______________________



9. ______________________



10. ______________________

UNIT XIII

TRANSPORTING PATIENTS

ANSWERS TO ASSIGNMENT SHEET #1

1. Knee-chest position
2. Fowler's position
3. Dorsal recumbent position
4. Lithotomy position
5. Sim's position
6. Prone position
7. Trendelenburg position
8. Orthopneic position
9. Lateral position
10. Supine position

UNIT XIII

TRANSPORTING PATIENTS

JOB SHEET #1--TRANSFER A PATIENT IN AND OUT OF BED

I. Tools and equipment required:

- A. Bathrobe
- B. Slippers
- C. Chair

II. Procedure:

- A. Explain to the patient what is going to be done.
- B. Provide privacy.
- C. Assist the patient in putting on a bathrobe.
- D. Ask the patient to move near the edge of the bed.
- E. Elevate the head of the bed.
- F. Place straight chair beside bed, near the middle.
- G. Take patient's pulse.
- H. Dangle the patient
    1. Place one arm around the patient's shoulder.
    2. Place the other arm under the patient's knees. Gently pivot the patient until the feet hang over the side of the bed.
    3. Put on the patient's slippers.
- I. Ensure patient's safety and comfort while out of bed.
- J. Check the patient's pulse rate, respiration, color, and general tolerance of the procedure periodically.
- K. At the end of the prescribed time for patient to be out of bed, place the pillow at the head of the bed.
- L. Remove the patient's bathrobe and slippers.

M. Assist the patient into bed.

N. Lower the head of the bed as desired.

O. Rearrange bed cover, and leave patient comfortable.

P. Check the patient's pulse before leaving and report it.

Q. Record the time and duration the patient was out of bed. Pulse, respiration, and patient's general tolerance of the procedure should be recorded.

UNIT XIII

TRANSPORTING PATIENTS

JOB SHEET #2--ASSIST PATIENT TO WALK

I. Tools and equipment required

   A. Bathrobe

   B. Slippers

   C. Chair

   D. Pillow

II. Procedures

   A. Greet patient and explain procedure.

   B. Provide privacy.

   C. Assist patient in putting on a bathrobe.

   D. Instruct patient to move to edge of bed.

   E. Elevate the head of the bed.

   F. Place straight chair at side of bed near middle.

   G. Take patient's pulse.

   H. Dangle the patient's feet by:

      1. Placing one arm around the patient's shoulders.

      2. Placing the other arm under the patient's hips. Gently pivot the patient until the patient's feet hang over the side of the bed.

      3. Put on patient's slippers.

   I. Tell the patient to rest both feet on the floor.

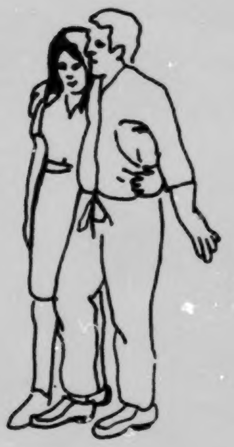
   J. Slide your arm under the patient's arm and put your hands around the patient's back.

   K. Ask the patient to place hands on your shoulders.

L. Once the patient is standing, let patient try out this position for a minute or two to get used to it and to keep balance.

M. If the patient is walking, ask to place the patient's arm around your shoulders, and place your nearest arm along side the patient's waist.

N. Walk with patient slowly and in step.



O. Let the patient sit down if tired.

P. Take pulse and respiration, and report findings if abnormal.

Q. If patient can walk unsupported but feels unsure, then attendant should walk just slightly behind patient and keep hands on patient's robe belt for support.

R. Make sure there are no other patient's pieces of furniture or other equipment in walking path.

S. Assist patient back into bed.

T. Take and record vital signs in patient's chart.

U. Report any unusual findings to the nurse in charge.

UNIT XIII

TRANSPORTING PATIENTS

JOB SHEET #3--ASSIST PATIENT INTO A WHEELCHAIR

I. Tools and equipment required

   A. Bathrobe

   B. 2 bath blankets

   C. Wheelchair

   D. Foot stool

   E. Pillow

   F. Slippers

II. Procedures

   A. Greet patient and explain procedure.

   B. Screen the unit.

   C. Cover the wheelchair with a bath blanket. Elevate foot pedals before placing patient in wheelchair.

   D. Place wheelchair near head of bed facing the foot of the bed. Lock chair.

   E. Lock bed.

   F. Fanfold top bedclothes to foot of bed.

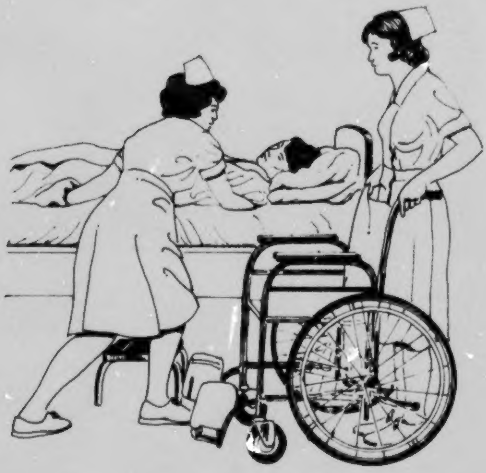
   G. Elevate head of bed.

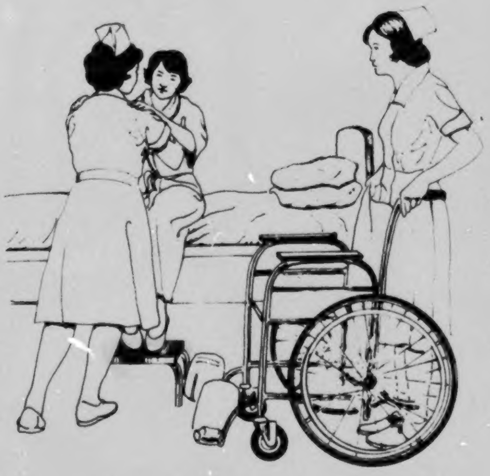
   H. Dress patient in robe and put on slippers.

   I. Place footstool at side of bed.

   J. Assist patient to dangle.

   K. Face patient and have him/her steady foot stool with foot. Have patient place feet on center of stool and place hands on attendant's shoulder. Attendant will place hands on rib cage of patient, under axillae, raise patient slightly, and help him/her to slide off edge of bed gradually to a standing position on the stool. Then have him/her step to the floor.

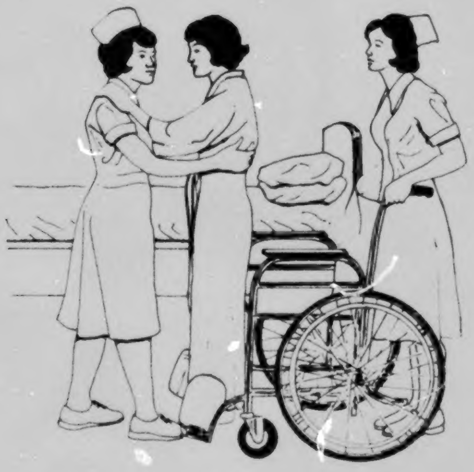


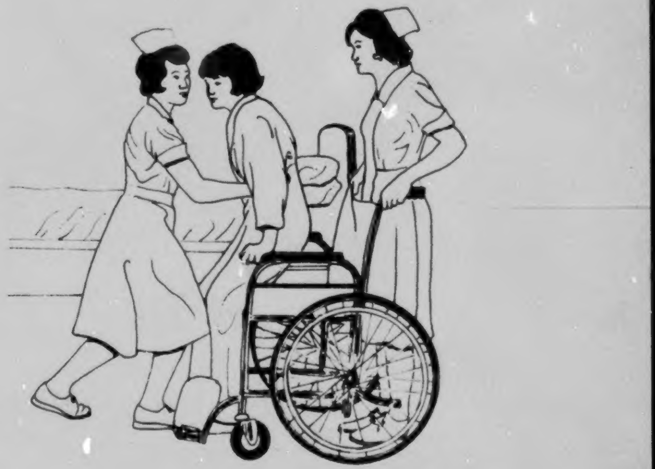


L. Keeping hands in the same position, help patient to turn slowly until the back is toward the wheelchair.

M. Have another attendant hold chair, lower patient gradually to sitting position in wheelchair. Arrange robe smoothly. Place feet on foot rest. Adjust foot rest.

N. Ask patient to place hands on arms of wheelchair for support as she/he is lowered into the chair.





O. Cover patient with bath blanket. Lower foot pedals.

P. Check patient's pulse.

Q. Teach patient to unlock and propel wheelchair.

R. Leave drinking water within reach of the patient.

S. Observe patient while sitting.

T. Make sure bed and unit are orderly.

U. Return patient to bed after prescribed period or sooner if necessary.

V. Replace equipment according to institution's policy.

UNIT XIII

TRANSPORTING PATIENTS

JOB SHEET #4--ASSIST PATIENT TO STAND

I. Tools and equipment required

   A. Bathrobe

   B. Slippers (non-skid)

   C. Chair

   D. Blanket

II. Procedures

   A. Greet patient and explain procedure.

   B. Provide privacy.

   C. Assist patient in putting on bathrobe.

   D. Instruct patient to move to the edge of the bed.

   E. Elevate the head of bed.

   F. Place straight chair beside bed near middle.

   G. Take patient's pulse.

   H. Dangle the patient's feet by:

      1. Placing one arm around the patient's shoulders.

      2. Placing the other arm under the patient's hips. Gently pivot the patient until the feet hang over the side of the bed.

      3. Put on slippers (non-skid) on patient's feet.

   I. Tell the patient to rest feet on the floor.

   (NOTE: If patient is already sitting in a chair, have patient slide to the edge of chair and proceed with procedure I.)

J. If assistance is needed, you may assist by sliding your arm under the patient's, and putting your hands around the patient's back.

K. Ask patient to place hands on your shoulders.

L. Once the patient is standing, allow patient to stand according to orders given in chart.

M. Repeat activity as instructed.

N. Take, record, and report the patient's pulse and respiration.

UNIT XIII

TRANSPORTING PATIENTS

JOB SHEET #5--ASSIST A PATIENT TO USE CRUTCHES

I. Tools and equipment required

  A. Crutches

  B. Robe

  C. Slippers

II. Procedures

  A. Greet patient and explain procedure.

  B. Identify patient's disability.

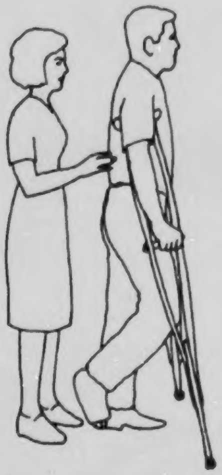
    1. Check chart.

    2. Check with head nurse.

  C. Assist patient to place crutches under arms.

  D. Have patient position crutches by placing weight on palms.

  E. Support patient in carrying out specific walking gait.



F. Stress equal timing without a pause between steps.

G. Watch gait and correct mistakes.

H. Assist patient in carrying out designated goal for each day.

I. Check patient's pulse at the end of the activity.

J. Record the time and duration of patient activity, as well as the patient's general tolerance of the procedure.

UNIT XIII

TRANSPORTING PATIENTS

JOB SHEET #6--PUT PATIENT ON A STRETCHER

I. Tools and equipment required:

  A. Stretcher

  B. Blanket

II. Procedures:

  A. Prepare stretcher according to institutional policy and take it to the unit.

  B. Greet patient and explain procedure.

  C. Screen the unit.

  D. Fanfold top bedclothes to foot of bed.

  E. Place stretcher at right angles to foot of bed. Lock the stretcher.

  F. Three attendants stand on the side of the bed by which the stretcher has been placed.

  G. First attendant cradles patient's head and shoulders with arms closest to head of bed and supports back with other arm.

  H. The second attendant supports buttocks with arm closest to head of bed. The attendant then supports thighs with the other arm.

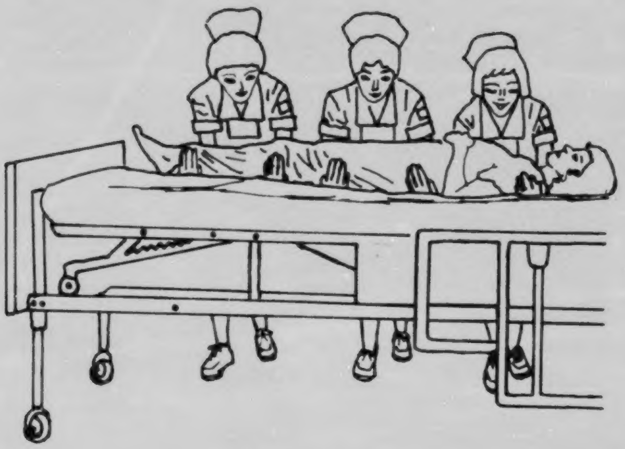
  I. The third attendant supports legs and feet.

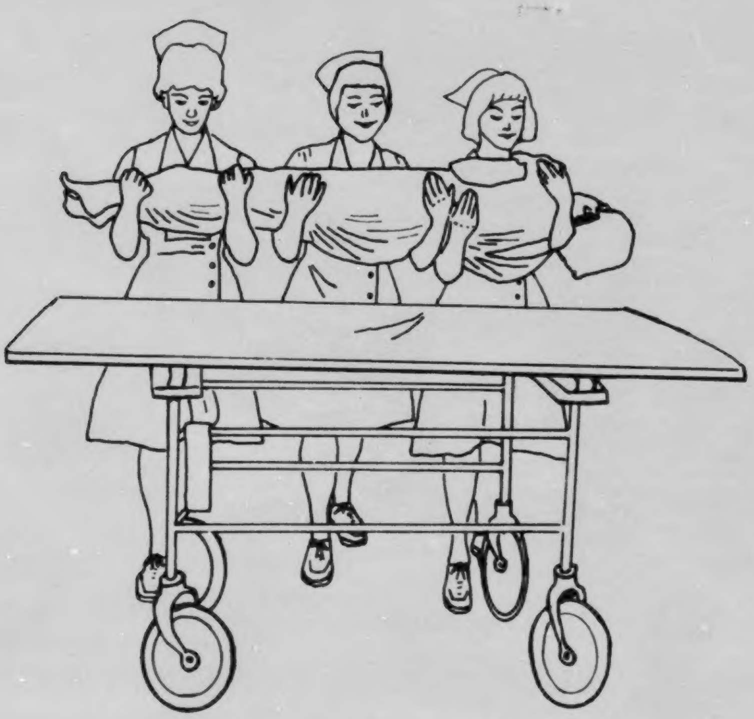
  J. Move patient to side of bed.

  K. Lift patient, holding close to chest. Step backward together and turn slowly. Pivot on attendant who is supporting patient's head and shoulders. Step forward and place patient on the stretcher.

  L. All attendants must have a good grip on the patient, and move together. Place patient on stretcher slowly to avoid discomfort.

M. Cover patient with blanket. Elevate head with one pillow.





UNIT XIII

TRANSPORTING PATIENTS

JOB SHEET #7--TURN THE PATIENT ON SIDE

I. Tools and equipment required

   A. Robe

   B. Cover

II. Procedures

   A. Lower the siderails and stand close to the bed on the side where you will move the patient.

   B. Move the patient's shoulders toward you.

   C. Move the patient's hips toward you.

   D. Have the patient flex the knees or cross one ankle over the other.

   E. Place the patient's arm closest to you across chest and the other arm along the side of the patient's head.

   F. Roll the patient to the side.

   G. Position the pillow to patient's back and between patient's knees.

UNIT XIII

TRANSPORTING PATIENTS

JOB SHEET #8--ACCOMPANY A PATIENT TO OTHER DEPARTMENTS

I. Tools and equipment required

   A. Vehicle

   B. Cover for patient

   C. Patient's chart

II. Procedures

   A. Greet patient and explain procedure.

   B. Assist patient into robe and slippers, or cover.

   C. Assist patient in/onto vehicle if needed.

   D. Push patient feet first or assist patient in walking.

   E. Notify personnel at destination.

   F. Report completion of transfer and return chart and vehicle.

UNIT XIII

TRANSPORTING PATIENTS

UNIT TEST

I. Match the terms on the right with the statement on the left.

______1. The way the body functions while you are standing, moving, and doing any job requiring physical effort.

______2. To turn the body by moving the feet rather than by twisting at the waist or hips.

______3. To move closer to the floor from a standing position by bending the knees and hips and keeping the back straight.

______4. To bend.

______5. The point around which all parts of the body exactly balance each other.

______6. Position of the body which determines the distribution of weight and the pull on the joints and muscles.

______7. A condition that may occur in which muscles contract, thicken and lose tone through lack of exercise.

______8. Arrangement of the patient's body so that all parts are in proper position in relation to each other.

a. Flex

b. Gait

c. Squat

d. Center of gravity

e. Body mechanics

f. Alignment

g. Posture

h. Dangle

i. Muscle contracture

j. Pivot

______9. To sit up in bed with feet off the bed, moving in free manner.

______10. A sequence of foot movements; a manner of walking.

II. Discuss rules for body mechanics.

III. List at least ten ways exercise promotes the functioning of the patient's body.

A.

B.

C.

D.

E.

F.

G.

H.

I.

J.

IV. List types of activity or exercise for patients.

V. Discuss the development of contracture.

VI. List five key points about body mechanics.

A.

B.

C.

D.

E.

VII. List and describe ten body positions.

A.

B.

C.

D.

E.

F.

G.

H.

I.

J.

VIII. Demonstrate the ability to:

A. Transfer a patient in and out of bed.

B. Assist a patient to walk.

C. Assist patient into a wheelchair.

D. Assist patient to stand.

E. Assist patient to use crutches.

F. Put patient on a stretcher.

G. Turn a patient on side.

H. Accompany a patient to another department.

(Note: If these activities have not been accomplished prior to the test, ask the instructor when they should be completed.)

UNIT XIII

TRANSPORTING PATIENTS

ANSWERS TO UNIT TEST

I. 1. e
2. j
3. c
4. a
5. d
6. g
7. i
8. f
9. h
10. b

II. Discussion should include:

A. Encourage patients to do as much as they can for themselves whenever possible. This will provide exercise and maintain muscle tone. It will help to prevent contracture.

B. Maintain a broad base of support by standing with feet comfortably apart, one foot forward, and toes pointed in the direction of movement.

C. Stand close to your work and flex the knees and hips when stooping.

D. Use the largest and strongest muscles of the arms and legs to prevent back strain.

E. Carry heavy objects close to the body.

F. Move the patient by rolling or turning whenever possible rather than lifting.

G. Pull the patient toward you whenever possible because it is less taxing than rolling her/him away from you.

III. The list should include:

A. Stimulates appetite

B. Stimulates circulation

C. Stimulates the bladder and bowel functions

D. Preserves strength

E. Tones the muscles

F. Helps prevent contracture

G. Relieves areas of pressure, and aids in preventing decubitus ulcers

H. Hardens and strengthens bones

I. Helps maintain blood pressure

J. Aids in preventing thrombi, and hypostatic pneumonia.

K. Reduces fatigue

IV. Activity or exercise list should include:

A. Range-of-motion exercise

B. Muscle - conditioning exercise

1. Isometric exercise

2. Resistive exercise

C. Assisting patient to dangle

D. Getting patient up in wheelchair

E. Assisting patient to walk

F. Putting patient on a stretcher

G. Turning a patient over in bed

V. Discussion should include:

A. Normal mobility depends upon the free movements of muscles and joints.

B. When muscles and joints are not used, the connective tissue fibers gradually become less pliable, a process called fibrosis.

C. Fibrosis restricts motion.

D. Fibrosis can lead to contracture and loss of mobility, if allowed to progress.

E. Contractures are very difficult to correct, treatment may require months or years of time or surgical correction.

F. Permanent deformity with contracture may occur in as short a time as three weeks.

G. Prevention of contracture is the best treatment.

VI. Answer should include:

A. Do not lift anything or anyone if you can push or pull. Move your patient by rolling over rather than by lifting whenever possible.

B. Watch your feet when lifting or moving equipment, you feet should be apart. You will be better balanced and more stable.

C. Move close to what you want to move or lift. Do not reach. You may strain arm and shoulder muscles by reaching.

D. Hold object close. Keep elbows relaxed and hold the objects close to the pelvic region of your body.

E. Squat. When close to the floor, keep your back straight, and bend your knees and your hips. Let your legs do the work,not your back.

F. Lift by straightening your legs, use the big, strong muscles in your legs, not the weak muscles in your back.

G. Pivot, do not twist, move your feet to turn, do not twist at the waist or hips.

H. Move smoothly and avoid jerky movement. Once you start to move, keep going. Do not stop and start again. If a person is helping you, move together. It is a good idea to count, "1-2-3-4"!

VII. Identification list should include:

A. Supine or horizontal recumbent--Patient lies on back with head and shoulders elevated slightly on a pillow.

B. Prone--Patient lies on abdomen with head turned to one side.

C. Lateral--Patient lies on the side with both arms forward, knees and hips flexed.

D. Fowler's--Head of bed is elevated to forty-five degrees or more; knees are elevated as necessary to maintain position.

E. Dorsal recumbent--Patient lies on back with knees flexed.

F. Semi-prone or Sims--Patient is between lateral and prone position,with lower arm behind body and upper arm flexed at shoulder and elbow; upper leg is flexed more than lower leg.

G. Trendelenburg--Patient lies on back with foot of the bed elevated on blocks at a forty-five degree angle.

H. Knee-chest--Patient kneels with buttocks upward, chest and head resting on bed.

I. Lithotomy--Patient lies on back, hips flexed and slightly abducted; knees acutely flexed; leg may be placed in leg holders or feet in stirrups.

J. Orthopneic--Patient sits with head and arms on a pillow on the overbed table; knees elevated for comfort.

VIII. Performance skills will be demonstrated to the satisfaction of the instructor.

UNIT XIV

CHARTING

UNIT OBJECTIVE

Upon the completion of this unit, the student will be able to identify, relate, and perform techniques relating to charting. This knowledge will be evidenced through demonstration and by satisfactorily completing a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Identify abbreviations frequently used in charting
2. Relate general rules for charting
3. Explain the importance of maintaining good records
4. Demonstrate the ability to use common abbreviations, signs, and symbols correctly in charting

UNIT XIV

CHARTING

SUGGESTED ACTIVITIES

I. Instructor
    A. Provide objective sheet
    B. Discuss objective sheet
    C. Pass out information sheet
    D. Discuss information sheet
    E. Make and show transparencies
    F. Distribute and discuss assignment sheets
    G. Explain abbreviations outlined in information sheets
    H. Give and evaluate test

II. Student
    A. Read and discuss objective sheet
    B. Read and discuss material contained in information sheet
    C. Complete assignment sheets
    D. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:
    A. Objective sheet
    B. Information sheet
    C. Assignment sheets
        1. Assignment Sheet #1--Identifying Abbreviations
        2. Assignment Sheet #2--Charting

D. Answers to Assignment Sheets

E. Unit test

F. Answers to unit test

II. References: Books

A. Atkinson, Betty J. The Medical Assistant. Albany, New York: Delmar Publishers, 1976.

B. Bredow, Miriam, and Marion G. Cooper. The Medical Assistant. 3rd ed. St. Louis, Missouri: McGraw-Hill Book Co., 1958

C. Caldwell, Esther, and Barbara Hegner. The Health Assistant. Albany, New York: Delmar Publishers, 1973.

UNIT XIV

CHARTING

INFORMATION SHEET

I. Abbreviations frequently used in charting

A. @ - at

B. āā - of each

C. abd. - abdomen

D. amb. - ambulatory (able to walk)

E. amt. - amount

F. Ax. - axillary

G. BP - blood pressure

H. C. - Celsius (centigrade)

I. c̄ - with

J. CBC - complete blood count

K. cc. - cubic centimeter

L. CC - chief complaint (in medical history)

M. dil. - dilute

N. disc - discontinue

O. EENT - eye, ear, nose and throat

P. elix - elixir

Q. F. - Fahrenheit

R. Fx - fracture

S. GI - gastrointestinal

T. GU - genitourinary

U. Gyn - gynecology

V. Hgb - hemoglobin

W. Hct - hematocrit

X. Ht - height

Y. I.M. - intramuscular

Z. b.i.d. - 2 times a day

AA. I.V. - intravenous

BB. lb. - pound

CC. liq - liquid

DD. ml. - milliliter

EE. mm. - millimeter

FF. NPO - nothing by mouth

GG. OB - obstetrics

HH. o.d. - right eye

II. OOB - out of bed

JJ. o.s. - left eye

KK. p.o. - by mouth

LL. PRN - as necessary

MM. q.d. - every day

NN. q.o.d. - every other day

OO. R - rectal

PP. R_x - prescription

QQ. RBC - red blood cells

RR. $\bar{s}$ - without

SS. s.c. or s. cut. - subcutaneous

TT. Sol - solution

UU. Sp. gr. - specific gravity

VV. TPR - temperature, pulse, respiration

WW. WBC - white blood cells

XX. W/C - wheel chair

YY. Wt - weight

ZZ. t.i.d. - three times a day

II. General rules for charting

A. Check the patient's name on the chart carefully before recording information. A good rule to follow is to look at the patient's name as you remove the chart, as you record, and again as you replace the chart.

B. All information charted must be printed or written clearly, legibly, and in ink.

C. When an entry is made on a record, the person recording the entry must sign or initial the entry. The date must precede each entry.

D. All information about the patient, including all diagnostic procedures, treatments, medications, and the results are carefully recorded. Include any unexpected reactions.

E. All unusual complaints, symptoms, or reactions are noted in detail. Also, the assistant must learn to be very observant and to record anything that seems to be pertinent to the care of the patient.

F. The spelling, abbreviations, symbols, and terminology used must always be correct.

III. The importance of maintaining good records

A. Provides information that may be used in a court of law

B. Provides an accurate, running account of the patient's

1. health

2. illness

3. injuries

4. diagnostic procedures

5. treatment

6. progress

C. Provides an accurate medical history

D. Information in record may be used for insurance claims

UNIT XIV

CHARTING

ASSIGNMENT SHEET #1--IDENTIFYING ABBREVIATIONS

Directions: Write the correct abbreviation for the following terms. Use information sheet section I as reference.

A. Axillary _____

B. Rectal _____

C. Left eye _____

D. Right eye _____

E. Amount _____

F. Intramuscular _____

G. Pound _____

H. Prescription _____

I. As necessary _____

J. Milligram _____

K. Celsius _____

L. Ambulatory _____

M. Hemoglobin _____

N. Hematocrit _____

O. Eye, ear, nose and throat _____

P. Gastrointestinal _____

Q. Every other day _____

R. Solution _____

S. White blood cells _____

T. Liquid _____

UNIT XIV

CHARTING

ASSIGNMENT SHEET #2--CHARTING

Directions: Chart the following information, using abbreviations when necessary. Use information sheet Section I, as reference.

A. Chief Complaint: Abdominal pains

B. Rectal temperature: Ninety-nine and four-tenths degrees Fahrenheit

C. Pulse: Eighty-six

D. Height: Five feet, four and one-third inches

E. Weight: One hundred twenty-seven pounds

UNIT XIV

CHARTING

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

A. Ax
B. R
C. o.s.
D. o.d.
E. amt
F. I.M.
G. lb.
H. R_x
I. PRN
J. mg
K. C
L. amb.
M. Hb or Hgb
N. H'crit or Hct
O. EENT
P. GI
Q. q.o.d.
R. Sol
S. WBC
T. liq.

Assignment Sheet #2

A. CC: abd. pains
B. R temp. 99.4°F.
C. Pulse: 86
D. Height: 5 ft. 4 1/3 in.
E. Weight: 127 lbs.

UNIT XIV

CHARTING

UNIT TEST

1. Match abbreviations on the right with terms on the left.

_____ a. Cubic centimeter

_____ b. Dilute

_____ c. Intramuscular

_____ d. Elixir

_____ e. Obstetrics

_____ f. Gynecology

_____ g. Every other day

_____ h. Red blood cell

_____ i. Specific gravity

_____ j. Complete blood count

_____ k. Temperature, pulse, respiration

_____ l. Out of bed

_____ m. Every day

_____ n. White blood cells

_____ o. Discontinue

_____ p. Wheel chair

_____ q. Two times a day

_____ r. Genitourinary

_____ s. Fracture

_____ t. Weight

1. CBC
2. Fx
3. Gyn
4. GI
5. IM
6. dil
7. NPO
8. OB
9. cc.
10. q.d.
11. RBC
12. Sp. gr.
13. TPR
14. disc.
15. WBC
16. W/C
17. OOB
18. q.o.d.
19. t.i.d.
20. elix.
21. b.i.d.

_____ u. Gastrointestinal

_____ v. Three times a day

_____ w. Prescription

_____ x. Millimeter

_____ y. Nothing by mouth

_____ z. Milliliter

22. GU
23. Wt.
24. R_x
25. mm.
26. ml.

2. Answer each statement below, by placing TRUE or FALSE in the blanks at the left.

_____ a. Check the patient's name on the chart before recording information.

_____ b. Check the patient's name on the record when it is pulled from the file and again before charting data.

_____ c. Charting may be done with a pencil.

_____ d. All information must be written or printed in a clear, legible manner.

_____ e. When an entry is made on any record, the person recording the entry must sign or initial the entry.

_____ f. The month, day, and the year must precede each entry.

_____ g. Nothing but medical information is recorded. Reactions or results are never recorded.

_____ h. All unusual complaints and symptoms are noted in detail.

_____ i. Spelling, abbreviations, symbols, and terminology used must always be correct.

3. Place a check (✓) in front of the correct statement concerning maintaining good records.

_____ a. Provides information that may be used in a court of law.

_____ b. For Internal Revenue Service

_____ c. For an accurate account of the patient's health and illness

_____ d. For an accurate account of the patient's injury, diagnostic procedures, treatment, and progress

_____ e. Information in record may be used for insurance claims

_____ f. For an accurate medical history

4. Demonstrate the ability to use common abbreviations, signs,and symbols correctly in charting.

(NOTE: If specific objective #4, has not been completed prior to test, ask the instructor when it should be completed.)

UNIT XIV

CHARTING

ANSWERS TO UNIT TEST

1. 9 a.
6 b.
5 c.
20 d.
8 e.
3 f.
18 g.
11 h.
12 i.
1 j.
13 k.
17 l.
10 m.
15 n.
14 o.
16 p.
21 q.
22 r.
2 s.
23 t.
4 u.
19 v.
24 w.
25 x.
7 y.
26 z.

2. T a.
T b.
F c.
T d.
T e.
T f.
F g.
T h.
T i.

3. ✓ a.
_____ b.
✓ c.
✓ d.
✓ e.
✓ f.

4. Evaluated to the satisfaction of the instructor.

UNIT XV

MEDICAL LABORATORY PROCEDURES

UNIT OBJECTIVE

After completing this unit, students will be able to identify and use basic laboratory equipment. Students will be able to perform simple laboratory procedures under supervision. This knowledge will be evidenced by demonstration and by the satisfactory completion of a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Identify common laboratory glassware.
2. Describe types of balances.
3. Discuss the use of calibrated and volumetric glassware.
4. Differentiate weight/volume and volume/volume percent solutions.
5. Use and care for the microscope.
6. Describe the procedures for collecting blood.
7. Recognize types of glassware.
8. Identify terms.
9. Solve simple arithmetic problems for laboratory procedures.
10. Measure specified amounts with a graduated cylinder and a volumetric flask.
11. Use graduated and volumetric pipettes.
12. Demonstrate procedure for use of triple beam balance.
13. Weigh dry chemicals,using triple beam balance.
14. Prepare percent solutions of sodium chloride.
15. Demonstrate the procedure for using the compound microscope.

UNIT XV

MEDICAL LABORATORY PROCEDURES

SUGGESTED ACTIVITIES

I. Instructor

   A. Provide objective sheet

   B. Discuss objective sheet

   C. Pass out information sheet

   D. Discuss information sheet

   E. Make and show transparencies

   F. Distribute and discuss assignment and job sheets

   G. Demonstrate procedures outlined in job sheets

   H. Give test and evaluate results

II. Student

   A. Read objective sheet

   B. Participate in discussion of objective sheet

   C. Read information sheet

   D. Participate in discussion of information sheet

   E. View transparencies

   F. Complete assignment sheets

   G. Demonstrate proficiency in performing procedures outlined on job sheets

   H. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit

   A. Objectives

   B. Information sheet

C. Transparency masters

  1. XV-TM-1--Glassware
  2. XV-TM-2--Triple Beam Balance
  3. XV--TM-3--Compound Microscope

D. Assignment sheets

  1. Assignment Sheet #1--Identification of Types of Glassware
  2. Assignment Sheet #2--Identification of Terms
  3. Assignment Sheet #3--Arithmetic Problems for Laboratory Procedures

E. Answers to assignment sheets

F. Job sheets

  1. Job Sheet #1--Use of a Graduated Cylinder and a Volumetric Flask
  2. Job Sheet #2--Use of Pipettes
  3. Job Sheet #3--Use of the Triple Beam Balance
  4. Job Sheet #4--Weighing Dry Chemicals
  5. Job Sheet #5--Preparing 100 ml. of 9% Sodium Chloride Solution
  6. Job Sheet #6--Preparing 100 ml. of .9% Solution From a 9% Solution of Sodium Chloride
  7. Job Sheet #7--Use of the Microscope

G. Test

H. Answers to test

II. References

A. Davidsohn, Israel and John Bernard Henry. Todd-Sanford Clinical Diagnosis by Laboratory Methods. Philadelphia, Pennsylvania: W. B. Saunders Co., 1974.

B. Edwards, Gabrielle I. and Marion Cimmino. Laboratory Techniques for High Schools. Woodbury, New York: Barron's Educational Series, Inc. 1974.

C. Taub, Howard. *Laboratory Skills for Allied Health Occupations* Vols. I and II. Corte Madera, California: Rinehart Press, 1974.

D. The University of Texas at Austin, Division of Extension. *Supervised Study Guide for Medical Laboratory Aide*. 4th ed. Austin, Texas: Texas State Department of Education, Industrial Education Division, 1970.

E. Wittman, Karl S. and John C. Thomas. *Medical Laboratory Skills*. New York, New York: Gregg Division/McGraw-Hill Book Company, 1977.

UNIT XV

MEDICAL LABORATORY PROCEDURES

INFORMATION SHEET

I. Identification of laboratory glassware

A. Glassware--Standard glassware is essential equipment in all laboratories. It is durable (if treated properly), easily cleaned, does not affect a chemical reaction, and does not readily stain. Most laboratory glassware is borosilicate glass (Pyrex) and will withstand extremes of temperature.

B. Types of glassware

a. Flasks

1. Erlenmeyer

2. Round bottom

3. Volumetric

b. Beakers

c. Funnels

d. Test tubes

e. Graduated cylinders

f. Reagent bottles

g. Pipettes

II. Types of balances

A. Triple beam balance

A triple beam balance has three marked beams. The beam closest to the student is numbered 1 through 10. Each number represents 1 gram. Each gram is divided into 10 parts, thus each division represents one/tenth of a gram.

This balance will weigh objects as small as one-tenth of a gram. Beams two and three are used for weighing larger quantities.

B. Double pan balance

To use the double pan balance, weights are added to the right pan. The object to be weighed is placed in the left pan. The needle swings in the center of the balance, and rests at zero when accurate balance has been achieved.

C. Analytical balance

The analytical balance is a sensitive and precise instrument which weighs with a precision of 0.1 mg. (.0001 gm).

III. Measuring with calibrated and volumetric glassware.

A. Graduated cylinders are designed to measure various quantities of liquid in graduated increments. A calibration is a mark on a laboratory tool that indicates amounts it will measure. For example, a 100 ml. cylinder graduated in 1 ml. increments may be used to measure any quantity from 1 ml. through 100 ml. (In actual practice, a cylinder of about the amount to be measured should be used for accurate measurement). In using the 100 ml. cylinder, note the two sets of numbers. Begin reading the scale at the bottom of the cylinder. One set of numbers begins at 100 and goes upward to zero. The other set starts at zero and rises to 100. Thus, if 85 ml. of liquid is poured into the cylinder, you would read the 85 ml. on the side beginning at zero. Readings of volume of liquids must always be made at the bottom of the meniscus. (A meniscus is the crescent-shaped curvature a liquid assumes when it is placed in a slender container. To read a volume of liquid in calibrated or volumetric glassware, the bottom of the meniscus is read against the graduation or calibration mark.)

B. Volumetric flasks are designed to contain a single given quantity. They are available in sizes from 1 ml. to 2,000 ml. and have one calibration on the neck of the container. They usually have a ground glass stopper and are used primarily in the preparation of specific volumes of reagents. In using volumetric flasks, always read the bottom of the meniscus against the calibration mark.

C. Pipettes are calibrated glass tubes open at both ends. They are used to measure small volumes of liquid with accuracy.

1. Types of pipettes

   a. Volumetric (transfer)--calibrated to measure a single, fixed volume (e.g., 1 ml.)

   b. Graduated--calibrated to measure various quantities within a given amount. (e.g., 10 ml. graduated in 1 ml.)

2. Safety precautions for use of pipettes

   a. Never use cracked, chipped, or broken pipettes. You may cut lips or fingers. Also, it is impossible to make accurate measurements with broken equipment.

   b. Never pipette contaminated or poisonous material. Such material is hazardous if introduced into the mouth.

   c. Do not put pipettes which have touched any other material back into reagent bottles, thereby contaminating the entire contents of the bottle.

IV. Types of percent solutions

A. Weight/volume solutions--The solution contains a weight of solute in a volume of solvent. Usually the solute is solid, but may be liquid or gas.

B. Volume/volume solutions--The solution contains a volume of solute in a volume of solution. The solute and the solvent are liquid.

(NOTE: The solute is the substance dissolved in a solution. The solvent is the liquid in which a solute is dissolved.)

V. Use and care of the microscope

A. Kinds of microscopes

1. Simple--Single lens or magnifying glass, magnifies up to 200x

2. Compound--Series of lenses to increase magnification, magnifies up to 1,000x

   a. Monocular--single eyepiece (ocular)

   b. Binocular--two eyepieces (oculars)

3. Dark field--light reflected from the specimen produces a light object on a dark background.

4. Electron--gives greatest magnification,up to 250,000x.

B. Parts of compound microscope

1. Eyepiece (ocular)--contains magnifying lens

2. Body tube (barrel)--connects eyepiece to objectives

3. Nosepiece--supports objectives

4. Arm--support by which microscope is carried

5. Stage--part of microscope where the slide is placed

6. Diaphragm--makes possible adjustment of amount of light entering objectives

7. Slide clips--hold glass slide in place

8. Mirror--reflects light rays into objective

9. Base--supports body of microscope

10. Fine adjustment--wheel that moves either stage or objective minimally for fine focusing

11. Coarse adjustment--wheel that moves either stage or objective maximally for first sighting of object

12. Objectives--contain lenses for magnification

13. Substage control--moves stage for focusing (not found on all microscopes)

14. Oil immersion objective--special objective on some microscopes. It is designed to be used with a drop of immersion oil between the object and the surface of the lens, useful in study of bacteria

C. Use of microscope

1. Keep both eyes open while using the microscope

2. Turn nosepiece until low power objective clicks into place.

3. Adjust the light source (mirror or substage lamp) with eye at eye piece. If using mirror, the flat side should face the stage if a condenser is used. Use the concave side of the mirror if no condenser is present.

4. Use the diaphragm to control the amount of light to be used.

5. Place slide on stage.

6. Using the coarse adjustment, move the tube downward until the low power objective is close to the slide. Be sure to watch the tube move as you turn the coarse adjustment wheel.

7. Never focus downward with coarse adjustment wheel while peering through the barrel. This will avoid breaking slides, cover slips, and even lenses.

8. Place eye at eye piece. Gradually move the tube upward until you see the object on the slide.

9. If you fail to find the object, repeat Steps 6 and 8.

10. Use the fine adjustment wheel to obtain a sharper image.

11. Readjust the light source and diaphragm to produce an optimum image.

12. Change the objectives from low power to high power. The image should stay in focus, but use the fine adjustment wheel to maintain a clear image.

13. When you have finished working with the microscope:

    a. Remove slide

    b. Clean eye piece, objectives, and stage with lens paper

    c. Place low power objective in place

   d. Focus all the way down with coarse adjustment wheel.

14. The magnification of the object viewed is the product of the magnification of the eye piece multiplied by the magnification of the objective used.

Example:		
	Eyepiece	10X
	Objective	40X
	Magnification	400X

D. Care of the microscope

1. Cleaning

   a. Always use lens paper to clean the ocular, objectives, and condensor of the microscope because these are hand-ground optical lenses. Even facial tissues, because they are made of wood fibers, may scratch the glass lenses.

   b. Xylol placed on lens paper may be used to clean especially dirty lenses, but use sparingly as xylol can damage the lens mounting.

   c. Xylol may be used to remove oil from the oil immersion lens. The lens is then dried with clean lens paper.

   d. The stage may be cleaned with xylol, followed by dry lens paper.

2. Transporting microscope

   Always use both hands. Carry the microscope with one hand on the arm and the other under the base. Never try to carry other objects, (books,notebooks) while carrying the microscope.

3. Storage of microscope

   Store microscope in designated safe place, in case, or enclosed shelves. Always cover the microscope when not in use to keep dust and dirt from lenses.

4. If your microscope does not function properly in any way, do not try to force it nor fix it, but notify your instructor at once. A microscope is an expensive piece of precision equipment.

VI. Collection of blood

A. Blood tests are among the most common laboratory procedures. Blood specimens are used for chemical, serological, hematologic, microbiological, and pre-transfusion tests.

B. Blood specimens may be whole clotted blood from which the serum is used, whole blood (to which an anticoagulant has been added) from which plasma is used, whole blood used in its entirety, or blood film placed on microscopic slide.

C. Methods of collecting blood

1. Venipuncture--method of choice for collection of several ml. of blood. Be sure you have all needed equipment as needle, syringe (vacutainer), alcohol sponge, tourniquet, and container for collected blood.

a. Identify patient, using I.D.

b. Greet patient and explain procedure

c. Bare arm above elbow

d. Apply tourniquet above elbow

(Avoid discomfort to patient) Ask patient to clench fist, causing veins to distend

e. Inspect patient's veins and select suitable site for puncture

f. Cleanse puncture site with alcohol sponge

g. Insert needle into vein, bevel side up

h. If using syringe, pull plunger back gently until required amount of blood is collected. (NEVER push plunger to force blood and/or air back into vein)

i. Release tourniquet; instruct patient to unclench fist

j. Remove needle quickly

k. Place fresh alcohol sponge over the wound

l. Bend patient's elbow to apply pressure on wound

m. Place blood in labeled containers

n. Place adhesive bandage (e.g., Band-Aid) over wound

o. Cleanse syringe and needle with cold water

p. Observe patient at all times for signs of discomfort, fainting, or nausea

q. Gather all materials used, thank patient for cooperation, and deliver blood to laboratory

2. Capillary puncture

Capillary puncture is the method of choice when small quantities of blood are needed.

a. Greet patient and explain procedure

b. Identify patient using I.D.

c. Be sure you have all necessary equipment

d. Cleanse the puncture site with an alcohol sponge, and dry with second dry sponge

e. Use sterile, disposable lancet

f. Grasp finger (ear lobe) and with quick, firm movement,make a deep puncture

g. Wipe away first drop of blood as it may contain foreign material

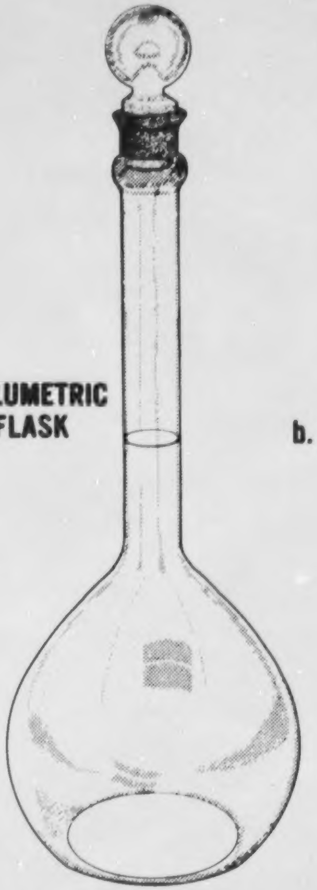
h. Collect blood as required for testing

(Capillary tubes, slides, or diluting pipettes)

i. Cleanse wound with alcohol sponge, and dry the site. Ask patient to hold the sponge over wound until bleeding stops

j. Thank patient for cooperation; gather all materials, including used lancet and sponges

GLASSWARE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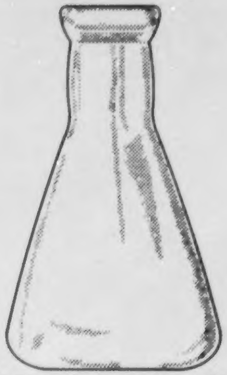
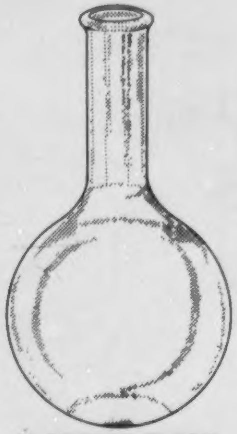
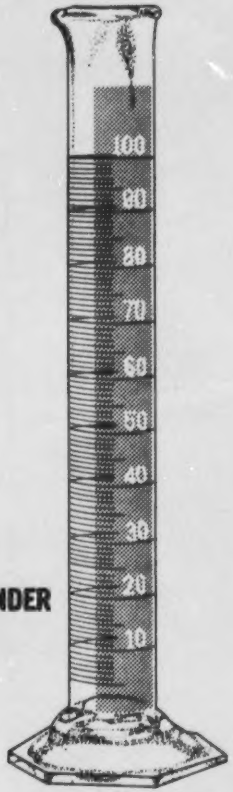

b. ERLENMEYER FLASK


c. FLORENCE FLASK


100
90
80
70
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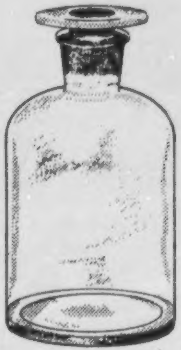
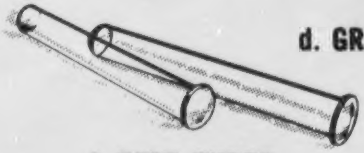
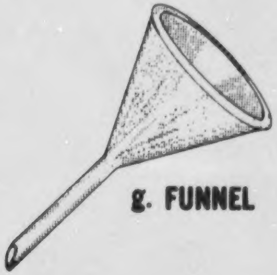
20
10
d. GRADUATED CYLINDER


e. BOTTLE AND STOPPER


f. TEST TUBES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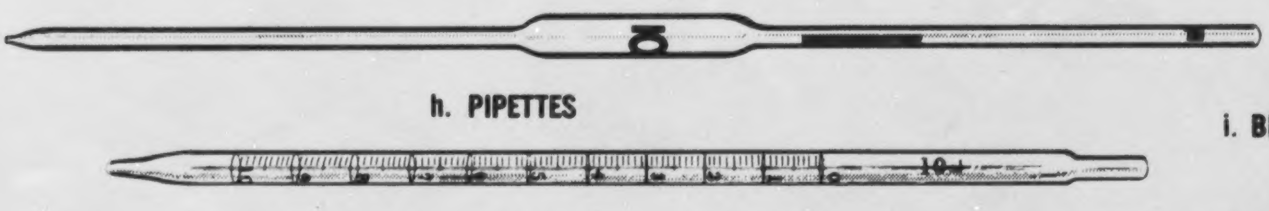
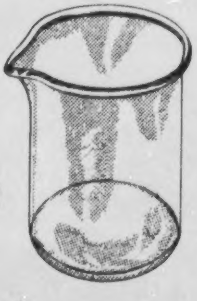
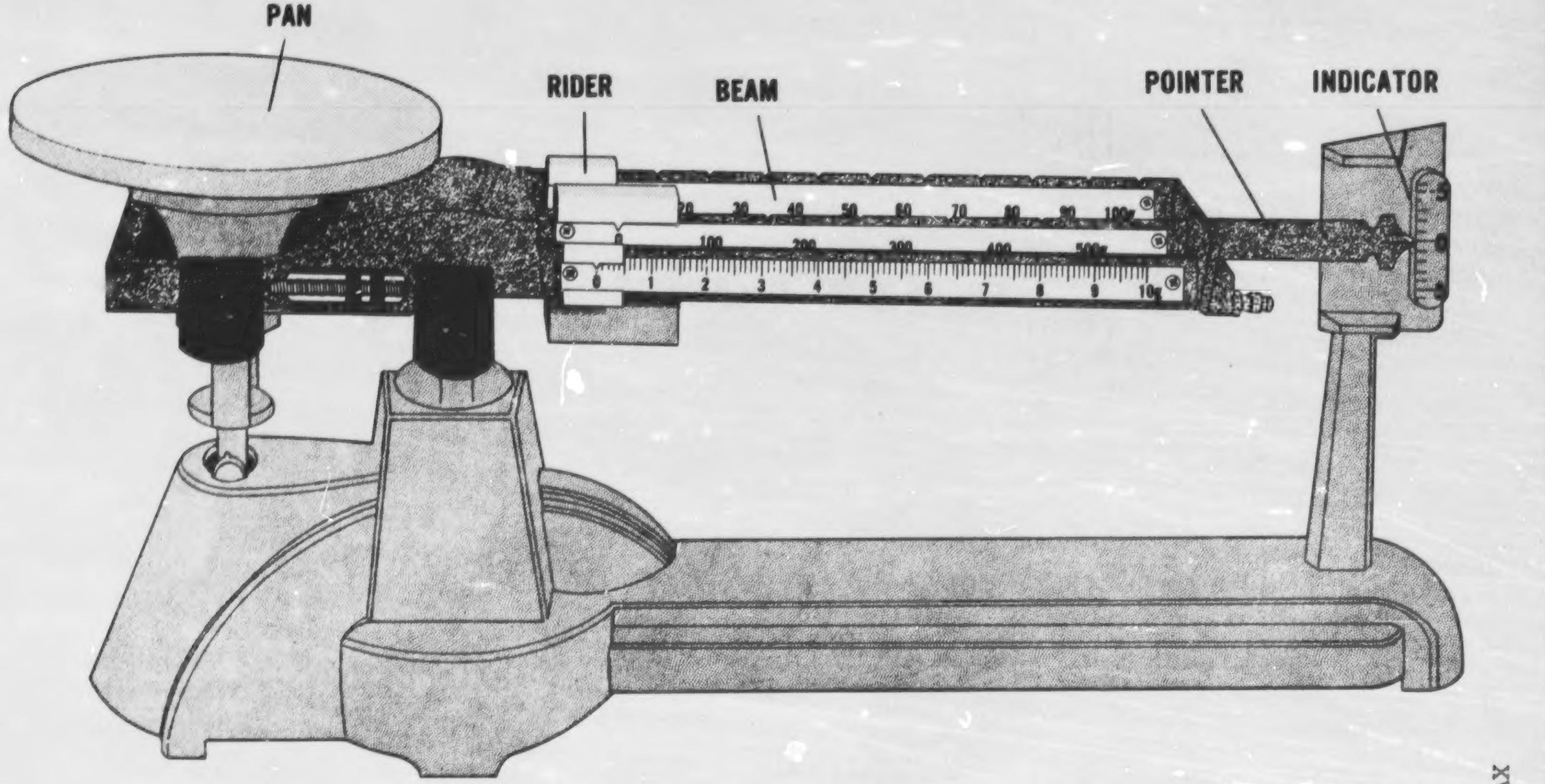

h. PIPETTES


i. BEAKER

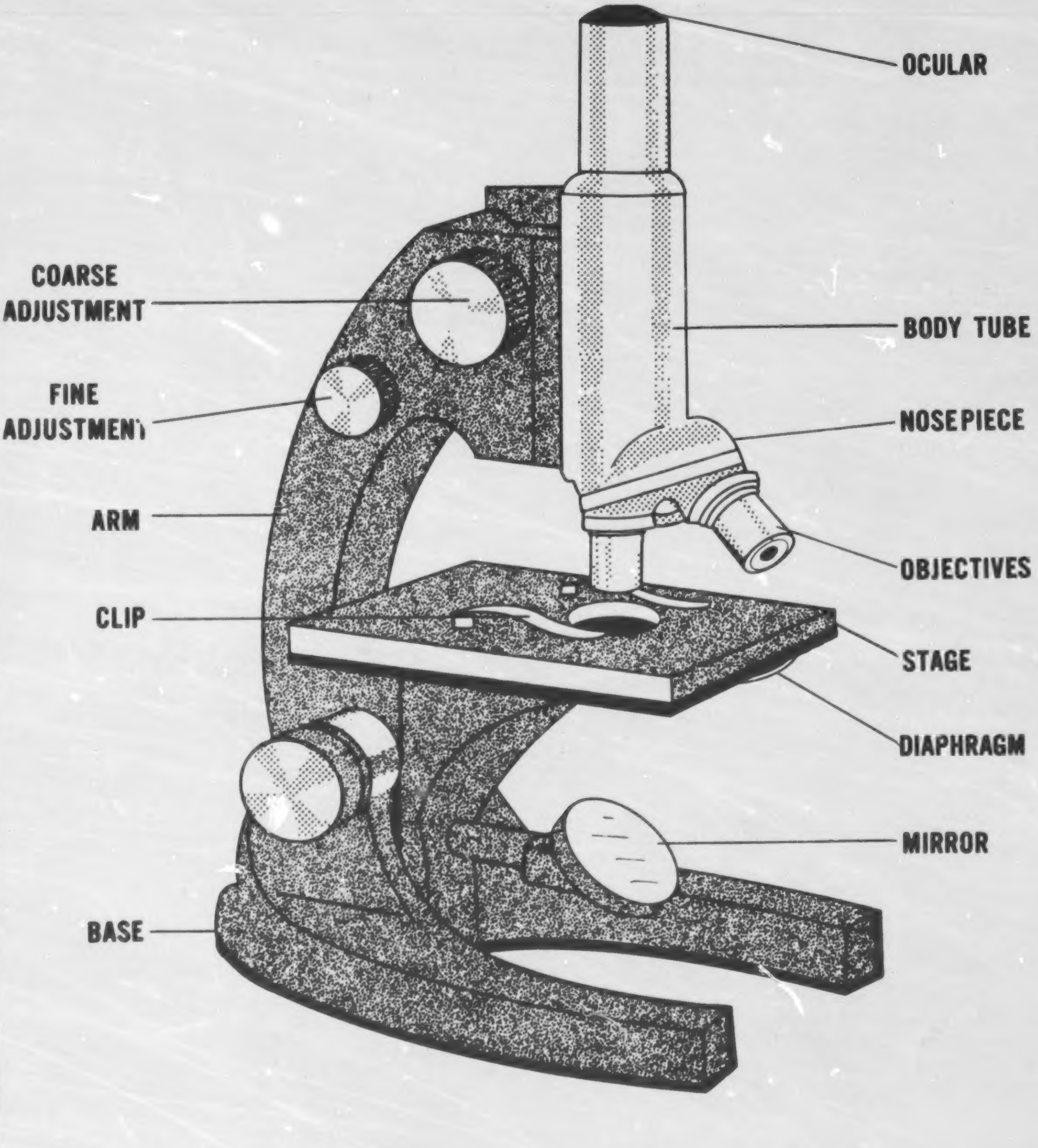
XV-TM-1

XV-17

TRIPLE BEAM BALANCE


PAN
RIDER
BEAM
POINTER
INDICATOR
20 30 40 50 60 70 80 90 100g
0 100 200 300 400 500g
0 1 2 3 4 5 6 7 8 9 10g
5 0 5

COMPOUND MICROSCOPE

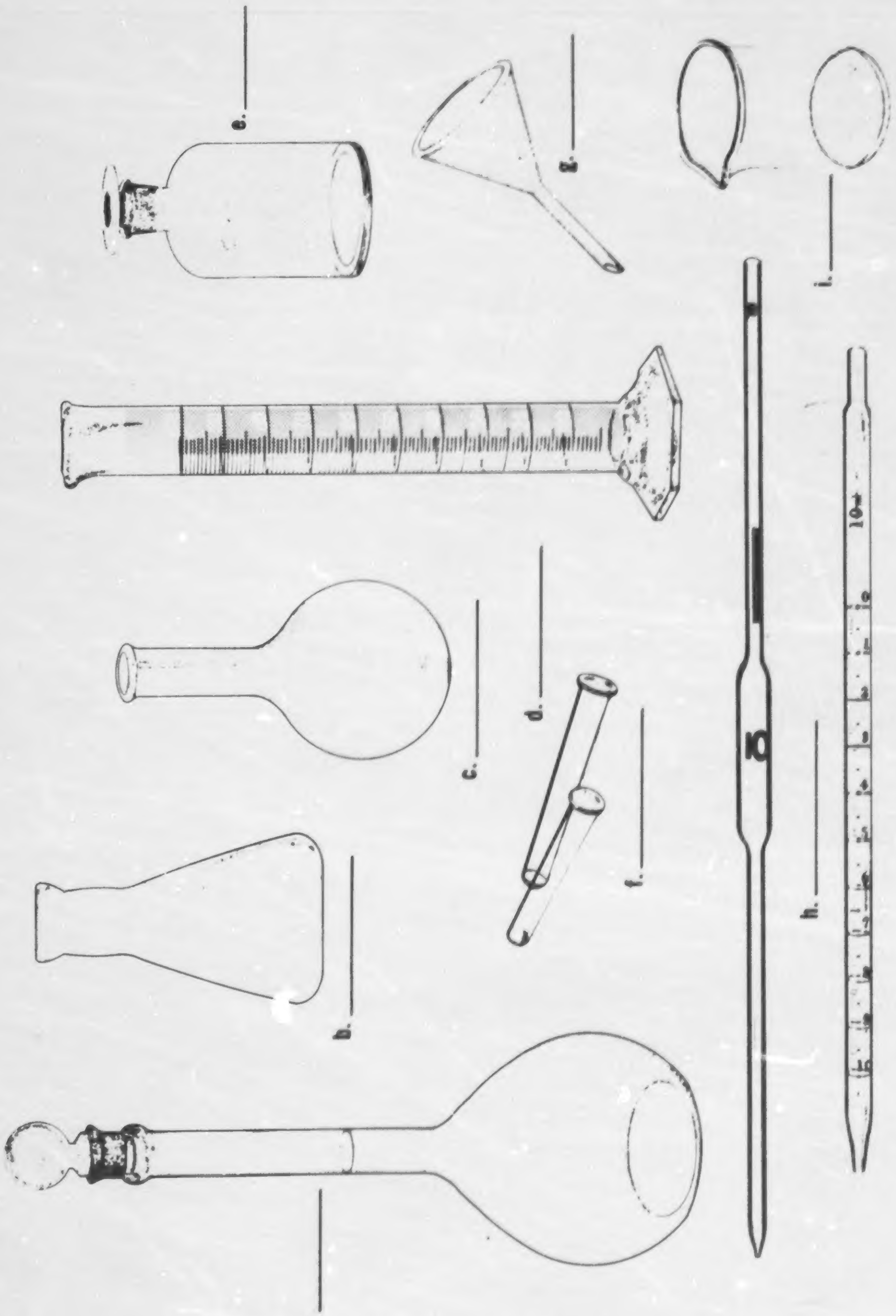

OCULAR
COARSE ADJUSTMENT
BODY TUBE
FINE ADJUSTMENT
NOSEPIECE
ARM
OBJECTIVES
CLIP
STAGE
DIAPHRAGM
MIRROR
BASE

UNIT XV

MEDICAL LABORATORY PROCEDURES

ASSIGNMENT SHEET #1--IDENTIFICATION OF GLASSWARE

Directions: Label each item of glassware pictured.



UNIT XV

MEDICAL LABORATORY PROCEDURES

ASSIGNMENT SHEET #2--IDENTIFICATION OF TERMS

Directions: Briefly identify the following terms:

a. meniscus

b. calibration

c. pipette

d. compound microscope

e. electron microscope

f. solute

g. solvent

h. lens paper

i. oil immersion objective

UNIT XV

MEDICAL LABORATORY PROCEDURES

ASSIGNMENT SHEET #3--ARITHMETIC PROBLEMS FOR LABORATORY PROCEDURES

Directions: Solve the following arithmetic problems for laboratory procedures.

1. What is the magnification if the eyepiece magnifies 10X and the low power objective magnifies 10X?

_______________(1)

2. What is the magnification if the eyepiece magnifies 7.5X and the high power objective magnifies 40X?

_______________(2)

3. What is the magnification if the eyepiece magnifies 10X and the oil immersion lens magnifies 90X?

_______________(3)

4. How much sodium chloride must you use to prepare 100 ml. of a 10% sodium chloride solution? To prepare 500 ml. of 10% sodium chloride?

_______________(4)

_______________(4)

5. If you have a 20% solution of sodium chloride and you wish to prepare 100 ml. of 5% sodium chloride, how much of the 20% sodium chloride and how much water will you need?

_______________(5)

_______________(5)

UNIT XV

MEDICAL LABORATORY PROCEDURES

ANSWERS TO ASSIGNMENT SHEET

Assignment Sheet #1

a. volumetric flask

b. Erlenmeyer flask

c. Florence flask

d. graduated cylinder

e. bottle and stopper

f. test tubes

g. funnel

h. pipettes

i. beaker

Assignment Sheet #2

a. meniscus--crescent-shaped curvature a liquid assumes, visible when liquid is placed in slender container

b. calibration--mark on a laboratory tool that indicates amounts it will measure. (e.g., graduated cylinder)

c. pipette--calibrated glass tube open on both ends, used to measure small volumes of liquid with accuracy

d. compound microscope--series of lenses to increase magnification

e. electron microscope--microscope that gives greatest magnification

f. solute--substance dissolved in a solution

g. solvent--liquid in which solute is dissolved

h. lens paper--paper used for cleaning lenses (microscope)

i. oil immersion objective--special objective on some microscopes used with a drop of immersion oil, useful in the study of bacteria

Assignment Sheet #3

1. 10 x 10 = 100X
2. 7.5 x [illegible]0 = 300X
3. 10 x 90 = 900X
4. $\frac{10\%}{100\%} = \frac{X}{100 \text{ ml.}}$

   $\frac{10}{100} \times \frac{100}{X} =$ 10X or 10 gm. sodium chloride

   $\frac{10\%}{100\%} = \frac{X}{500 \text{ ml.}}$

   $\frac{10}{100} \times \frac{500}{X} =$ 50X or 50 gm. sodium chloride

5. $\frac{5\%}{20\%} = \frac{X}{100}$

   $\frac{5}{20} \times \frac{100}{X} =$ 25X or 25 ml. 20% sodium chloride

   100 ml. total solution
   25 ml. 20% sodium chloride

   75 ml. water

UNIT XV

MEDICAL LABORATORY PROCEDURES

JOB SHEET #1--USE OF GRADUATED CYLINDER AND VOLUMETRIC FLASKS

I. Tools and equipment required

100 ml. graduated cylinder

100 ml. volumetric flask

Water colored with food coloring

Medicine dropper

II. Procedures

A. Graduated cylinder, 100 ml.

1. Note the two sets of numbers. Begin reading the scale at the bottom of the cylinder. One set of numbers begins at 100 and goes upward to zero. The other set starts at zero and ascends to 100. Thus, if 35 ml. of liquid is poured into the cylinder you would read the 35 ml. on the side beginning at zero.

2. Fill the cylinder with colored water almost to the 30 ml. mark. Use medicine dropper to add the last few drops, insuring accuracy. Read the bottom of the meniscus.

3. When filling a cylinder with liquid, pour the liquid along the side of the container and allow some time for drainage to insure accuracy of measurement.

4. When pouring contents from the cylinder, use the lip, pour slowly, and allow time for drainage.

5. Practice filling and emptying your graduate, using quantities suggested by your instructor.

6. If other sizes of graduates are available, practice filling and emptying them.

B. Volumetric flasks.
(NOTE: A volumetric flask has a single calibration mark on the neck of the container.)

1. Pour colored water into the 100 ml. flask to the calibration. If necessary, use the medicine dropper for the final few drops. Read the bottom of the meniscus.
2. Fill other sizes of volumetric flasks that are available,using the same procedure.

UNIT XV

MEDICAL LABORATORY PROCEDURES

JOB SHEET #2--USE OF PIPETTES

I. Tools and equipment required:

Volumetric pipette

Graduated pipette

Beaker

Salt solution colored with red food coloring

II. Procedures:

A. Select a volumetric pipette.

B. Hold the stem of the pipette between thumb and middle finger, leaving index finger free.

C. Do not cover the calibration with your fingers.

D. Place tip of pipette in beaker of colored salt solution--tip must remain below surface of liquid to avoid drawing in air.

E. Apply mouth to mouthpiece; carefully draw colored solution into the pipette well above the calibration mark.

F. Try to keep the mouthpiece of the pipette dry.

G. Remove pipette from mouth and quickly cover mouthpiece with index finger--holding salt solution in pipette.

H. Release pressure to allow salt solution to leave pipette gradually until bottom of meniscus is at desired calibration.

I. Then place tip of pipette in second beaker and allow solution to drain.

J. Repeat pipetting process, using graduated pipette. In using the graduated pipette however, blow the last drop from the pipette rather than allowing it to drain as you did with the volumetric pipette.

K. Continue to practice the transfer of salt solution with pipettes until you have attained accuracy.

UNIT XV

MEDICAL LABORATORY PROCEDURES

JOB SHEET #3--USE OF THE TRIPLE BEAM BALANCE

I. Tools and equipment required:

Triple beam balance

Erlenmeyer flask

Chalk

II. Procedures:

A. Note that the indicator of the balance is resting at zero.

B. Each beam is divided into equal parts.

C. The first beam measures 10 gms., divided into 100 equal parts. (1/10 gm.)

D. The second beam measures 100 gms., divided into 100 equal parts. (1 gm.)

E. The third beam measures 100 gms., divided into 10 equal parts. (10 gms.)

F. Place a piece of chalk on the pan. The indicator will move above zero.

G. The number of grams indicated by the rider is the weight of the chalk. Record weight of chalk, return the rider to zero, and remove the chalk.

H. Place a 125 ml. Erlenmeyer flask on the pan. The indicator will rise above zero.

I. Move the rider on the first beam. If the indicator does not move to zero, the flask weighs more than 10 gms. Move the rider on the second beam until the indicator is at zero. The weight of the flask is the total of the readings on the two beams. Return the riders to zero. Record the weight of the flask.

J. Place 10 ml. of water in the flask and repeat the procedure. You may need to use the third beam. Record the weight of the flask and water.

K. Return all riders to zero.

L. Clean pan.

M. Be sure the indicator remains on zero.

UNIT XV

MEDICAL LABORATORY PROCEDURES

JOB SHEET #4--WEIGHING DRY CHEMICALS

I. Tools and equipment required

Triple beam balance

Soldium chloride

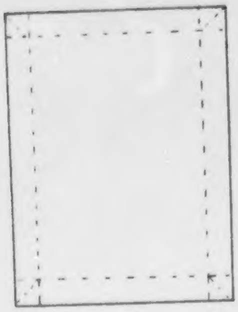
Weighing paper

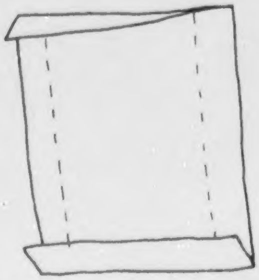
Volumetric flask, 100 ml.

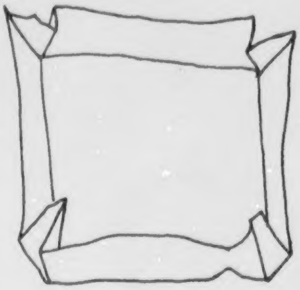
Spatula

II. Procedures

A. Fold weighing paper to form container







B. Place paper container on pan and determine weight

C. Add weight of paper to weight of sodium chloride (9 gm.)

(EXAMPLE: .2 gm. + 9 gm. = 9.2 gm.

D. Set rider of first beam at 9.2 gm.

E. Using spatula, add sodium chloride to paper until indicator is at zero

F. If indicator goes above zero, this indicates that you have more than 9.2 gms. Remove excess sodium chloride carefully, using spatula, until indicator rests at zero.

G. The excess sodium chloride removed should be discarded rather than returned to the bottle.

H. Place the 9 gms. of sodium chloride in the 100 ml. volumetric flask.

UNIT XV

MEDICAL LABORATORY PROCEDURES

JOB SHEET #5--PREPARING 100 ml. OF 9% SODIUM CHLORIDE SOLUTION

I. Tools and equipment required

Triple beam balance

Sodium chloride, A.R., A.C.S., or C.P.

Distilled water

Weighing paper

Volumetric flask, 100 ml.

Stoppered reagent bottle

II. Procedures

A. Weigh 9 gms. of sodium chloride (see Job Sheet #4)

B. Place sodium chloride in 100 ml. volumetric flask

C. Add about 50 ml. of distilled water and swirl flask until sodium chloride is dissolved

D. Continue to add distilled water to reach the 100 ml. mark. (Read the bottom of the meniscus).

E. Pour solution into stoppered bottle

F. Prepare label, include name of solution, strength, date prepared, and your initials

9% Sodium Chloride

12/25/78 L.F.

UNIT XV

MEDICAL LABORATORY PROCEDURES

JOB SHEET #6--PREPARING 100 ml. OF .9% SOLUTION FROM A 9% SOLUTION OF SODIUM CHLORIDE

I. Tools and equipment required

9% solution of sodium chloride

100 ml. volumetric flask

Distilled water

10 ml. volumetric pipette

Stoppered reagent bottle

Label

II. Procedures

A. Use simple proportion to determine the amount of 9% sodium chloride needed to prepare 100 ml. 9% sodium chloride.

$$\frac{.9}{9} = \frac{X}{100}$$

$$X = 10$$

B. Use 10 ml. of 9% sodium chloride diluted to 100 ml.

C. Place 10 ml. of 9% sodium chloride in 100 ml. volumetric flask, using 10 ml. volumetric pipette.

D. Fill flask half full with distilled water.

E. Mix by swirling.

F. Add distilled water to 100 ml. mark. (Read the bottom of the meniscus). Place stopper in flask and mix by inverting.

G. Pour solution into stoppered bottle.

H. Prepare label, include name of solution, strength, date prepared, and your initials.

UNIT XV

MEDICAL LABORATORY PROCEDURES

JOB SHEET #7--USE OF MICROSCOPE

I. Tools and equipment required

Compound microscope

Glass slide

Forceps

Cover glass

Newspaper clipped to contain letter e

II. Procedures

1. Place a piece of newsprint containing the letter e on a glass slide
2. Moisten the paper on the slide to hold it in place
3. Cover newspaper with cover glass
4. Place the newspaper on the slide so that the letter e can be placed on the stage as you would read it
5. Refer to information sheet for precise instructions on use of the microscope
6. Focus on the letter e,using the low power objective
7. Notice the letter appears reversed
8. Move the slide carefully to the right, then to the left. Note that again, the movement appears reversed
9. Remove the slide
10. Practice using the microscope using available prepared slides

UNIT XV

MEDICAL LABORATORY PROCECURES

UNIT TEST

1. Identify the glassware depicted on the diagram by placing the name of each item in the lettered blanks.

a. ____________________
b. ____________________
c. ____________________
d. ____________________
e. ____________________
f. ____________________
g. ____________________
h. ____________________
i. ____________________

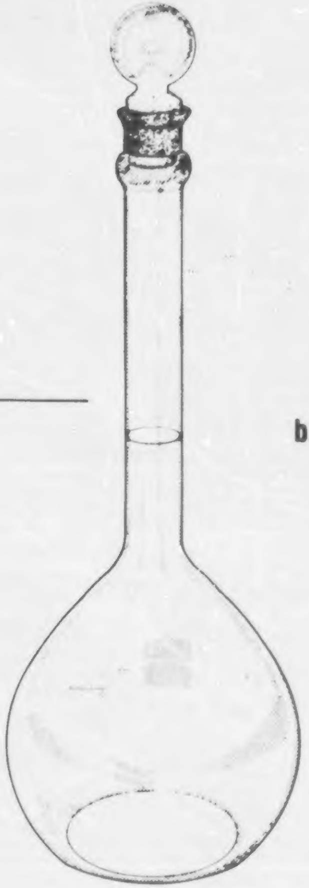
2. Discuss three types of balances.

a.

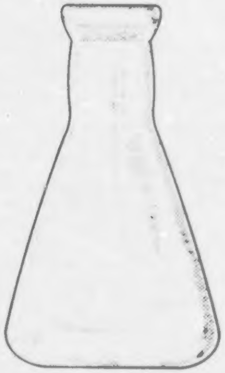
b.

c.

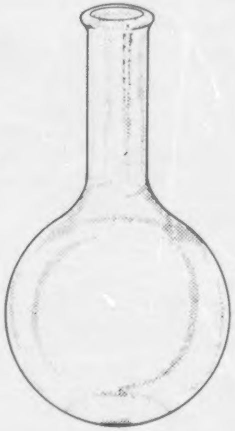
GLASSWARE



a. ____________

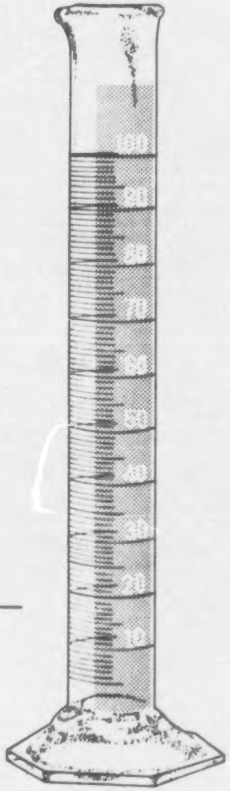


b. ____________



c. ____________

d. ____________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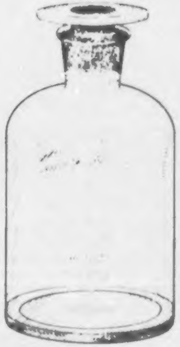
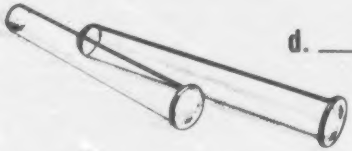
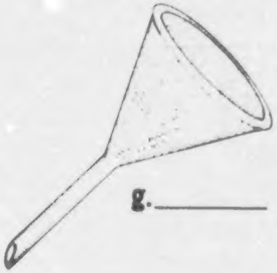


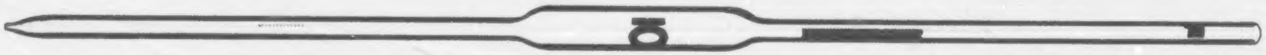
e. ______



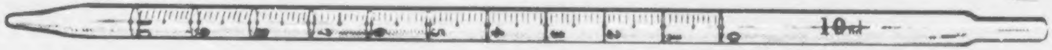
f. ____________



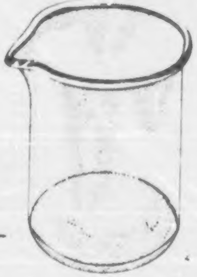
g. ______



h. ____________



i. ______



XV-47

3. a. Discuss the use of the following calibrated and volumetric glassware.

   1. Graduated cylinder

   2. Volumetric flask

   3. Pipettes

      a.

      b.

b. List three safety precautions that must be observed in the use of pipettes.

1.

2.

3.

4. Differentiate weight/volume and volume/volume percent solutions.

5. Summarize the uses and care of the microscope by completing the following statements.

a. Four general types of microscopes are compound, dark field, simple, and ______________a.

b. The part of the microscope that contains the eyepiece and the objectives is the ______________b.

c. The part of the microscope that supports the objective is the ______________c.

d. The support by which the microscope is carried is the ______________ d.

e. The part of the microscope where the slide is placed is the ______________ e.

f. The part of the microscope that makes possible the adjustment of the amount of light entering the objective is the ______________ f.

g. The wheel that moves either the stage or objective minimally for fine focusing is the ______________ g.

h. The objectives of the microscope contain ______ for magnification. ______________ h.

Answer the following questions about the use of the microscope.

i. Which objective is used for finding the specimen? ______________ i.

j. Which adjustment wheel is used to move the tube of the microscope rapidly downward? (You would not have your eye to the eyepiece for this procedure) ______________ j.

k. Which adjustment wheel is used to obtain a sharp image of an object? ______________ k.

l. List four things to do when you have finished using the microscope to prepare it for storage

1.

2.

3.

4.

m. What two figures are multiplied to determine the magnification of the object viewed?

n. What chemical may be used to clean the lens of the microscope?

o. What chemical may be used to remove oil from the oil immersion lens?

p. What type of paper is used to clean the microscope?

q. In transporting the microscope, how should it be carried?

r. If your classroom microscope does not function properly, what should you do?

6. Describe procedure in each method of blood collection.

   a. Venipuncture

b. Capillary puncture

7. Recognize types of glassware.

8. Identify terms

9. Solve simple arithmetic problems for laboratory procedures

10. Measure specified amounts with graduated cylinder and volumetric flask.
11. Use graduated and volumetric pipettes.
12. Demonstrate procedure for use of triple beam balance.
13. Weigh dry chemicals, using triple beam balance.
14. Prepare percent solutions of sodium chloride.
15. Demonstrate the procedure for using the compound microscope.

(NOTE: If activites #7 - #15 have not been completed prior to the test, ask the instructor when they should be completed.)

UNIT XV

MEDICAL LABORATORY PROCEDURES

ANSWERS TO UNIT TEST

1. a. volumetric flask
   b. Erlenmeyer flask
   c. Florence flask
   d. graduated cylinder
   e. bottle and stopper
   f. test tubes
   g. funnel
   h. pipettes
   i. beaker

2. a. Triple beam balance

   A triple beam balance has three marked beams. The beam closest to the student is numbered 1 through 10. Each number represents 1 gram. Each gram is divided into 10 parts, thus each division represents one/tenth of a gram. This balance will weigh objects as small as one/tenth of a gram. Beams two and three are used for weighing larger quantities.

   b. Double pan balance

   To use the double pan balance, weights are added to the right pan. The object to be weighed is placed in the left pan. The needle swings in the center of the balance and rests on zero when accurate balance has been achieved.

   c. Analytical balance

   The analytical balance is a sensitive and precise instrument which weighs with a precision of .1 mg. (.0001 gm.)

3. a. 1. Graduated cylinders are designed to measure various quantities of liquid in graduated increments. For example, a 100 ml. cylinder graduated in 1 ml. increments may be used to measure any quantity from 1 ml. through 100 ml. In using the 100 ml. cylinder, note the two sets of numbers. Begin reading the scale at the bottom of the cylinder. One set of numbers begins at 100 and goes upward to zero. The other set starts at zero and rises to 100. To read a volume of liquid in calibrated glassware, the meniscus is read against the graduation mark.

        2. Volumetric flasks are designed to contain a single given quantity. They are available in sizes from 1 ml. to 2,000 ml., and have one calibration on the neck of the container. They usually have a ground glass stopper and are used primarily in the preparation of specific volumes of reagents. In using volumetric flasks, always read the bottom of the meniscus against the calibration mark.

        3. Pipettes are calibrated glass tubes open at both ends. They are used to measure small volumes of liquid with accuracy.

            a. Volumetric pipettes are calibrated to deliver a single, fixed volume.

            b. Graduated pipettes are calibrated to measure various quantities within a given amount.

    b. Safety precautions for use of pipettes

        1. Never use cracked, chipped, or broken pipettes. You may cut lips or fingers. Also, it is impossible to make accurate measurements with broken equipment.

        2. Never pipette contaminated or poisonous material. Such material is hazardous if introduced into the mouth.

        3. Do not put pipettes which have touched any other material back into reagent bottles, thereby contaminating the entire contents of the bottle.

4. Weight/volume solutions contain a weight of solute in a volume of solution, Usually the solute is solid, but may be liquid or gas.

    Volume/volume solutions contain a volume of solute in a volume of solution. The solute is a liquid.

5. a. electron

    b. barrel

    c. nosepiece

    d. arm

    e. stage

    f. diaphragm

    g. fine adjustment

    h. lenses

    i. low power

    j. coarse adj. wheel

k. fine adj. wheel

l. 1. Remove slide

   2. Clean eye piece, objectives, and stage

   3. Place low power objective in place

   4. Focus all the way down with the coarse adjustment wheel

m. magnification of eyepiece X magnification of the objective

n. xylol (xylene)

o. xylol (xylene)

p. lens paper

q. carry the microscope with one hand holding it by the carrying arm and the other hand supporting the base.

r. notify the instructor at once. Do not try to repair your microscope.

6.a. Venipuncture is the method of choice for the collection of several ml. of blood.

(1) Identify the patient using I.D.

(2) Greet the patient and explain the procedure

(3) Bare arm above elbow

(4) Apply tourniquet above the elbow (avoid discomfort to patient)
Ask the patient to clench fist, causing veins to distend

(5) Inspect patient's veins and select suitable site for puncture

(6) Cleanse puncture site with alcohol sponge

(7) Insert needle into vein, bevel side up

(8) If using syringe, pull plunger back gently until required amount of blood is collected. (NEVER push plunger to force blood and/or air back into the vein)

(9) Release tourniquet, instruct patient to unclench fist

(10) Remove needle quickly

(11) Place fresh alcohol sponge over the wound

(12) Bend patient's elbow to apply pressure on wound

(13) Place blood in labeled containers

(14) Place adhesive bandage (Band-Aid) over wound

(15) Cleanse syringe and needle with cold water

(16) Observe patient at all times for signs of discomfort, fainting, or nausea

(17) Gather all materials used, thank patient for cooperation, and deliver blood to laboratory

b. Capillary puncture is the method of choice when small quantities of blood are needed

(1) Identify patient,using I.D.

(2) Greet patient and explain procedure

(3) Be sure you have all the necessary equipment

(4) Cleanse the puncture site with an alcohol sponge, and dry with a second dry sponge

(5) Use sterile, disposable lancet

(6) Grasp finger (ear lobe) and with quick, firm movement, make a deep puncture

(7) Wipe away the first drop of blood as it may contain foreign material

(8) Collect blood as required for testing (capillary tubes, slides, or diluting pipettes).

(9) Cleanse wound with alcohol sponge and dry the site. Ask patient to hold the sponge over the wound until bleeding stops.

(10) Gather all materials, including used lancet and sponges, thank patient for cooperation,and deliver blood to laboratory

7 - 15 Evaluated to the satisfaction of the instructor.

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

UNIT OBJECTIVE

After completing this unit, the student will be able to identify types of wounds, bone and joint injuries, and burns. The student will be able to describe types of poisons, define shock, and demonstrate standard first aid treatment. This knowledge will be evidenced through demonstration and by satisfactorily completing a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Define first aid and identify priorities.
2. Give the ratio of compressions to breaths in CPR.
3. Identify kinds of wounds.
4. Identify types of bone and joint injuries and explain immobilization for neck and back injuries.
5. Classify burns and give treatment for each type.
6. Describe types of poisons and outline first aid treatment for poisoning.
7. Identify signs and symptoms of choking.
8. Define shock, describe early stages, and indicate treatment.
9. List varying sources of first aid materials.
10. Label pressure points on diagram.
11. Label pressure points to be used in control of bleeding of various areas of body.
12. Compile chart on types of burns and their treatment.
13. Construct poster showing causes, degrees, and prevention of burns.

14. Demonstrate the ability to:

    a. Perform cardiopulmonary resuscitation.

    b. Control bleeding of wound.

    c. Apply a spiral turn bandage.

    d. Splint a fracture of a forearm.

    e. Splint a fracture of a lower leg.

    f. Position victim for treatment of shock.

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

SUGGESTED ACTIVITES

I. Instructor:

   A. Provide objective sheet

   B. Discuss objective sheet

   C. Provide information sheet

   D. Discuss information sheet

   E. Make and show transparencies

   F. Distribute and discuss assignment and job sheets

   G. Demonstrate procedures outlined in job sheets

   H. Give test and evaluate results

   I. Invite resource speaker from local Red Cross chapter or Heart Association

II. Student:

   A. Read objective sheet

   B. Participate in discussion of objective sheet

   C. Read information sheet

   D. Participate in discussion of information sheet

   E. View transparencies

   F. Complete assignment sheets

   G. Demonstrate proficiency in performing procedures outlined in job sheets

   H. Take test

   I. Listen to guest speaker's presentation

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objectives

   B. Information sheet

   C. Transparency masters

      1. XVI-TM-1--Pinching Nose

      2. XVI-TM-2--Breathing Into Mouth

      3. XVI-TM-3--Listening for Return of Air

      4. XVI-TM-4--Pressure Points

      5. XVI-TM-5--Types of Fractures

      6. XVI-TM-6--Making a Sling

      7. XVI-TM-7--Spiral Bandage of Limb

   D. Assignment sheets

      1. Assignment Sheet #1--Sources of First Aid Materials

      2. Assignment Sheet #2--Control of Bleeding-Pressure Points

      3. Assignment Sheet #3--Identification of Burns

      4. Assignment Sheet #4--Burns--Causes, Degrees, and Prevention

   E. Answers to assignment sheets

   F. Job sheets

      1. Job Sheet #1--Performance of Cardiopulmonary Resuscitation

      2. Job Sheet #2--Control Bleeding of Wound in Forearm

      3. Job Sheet #3--Applying a Spiral Turn Bandage to a Forearm

      4. Job Sheet-#4--Splinting a Fracture of a Forearm

5. Job Sheet #5--Splinting a Fracture of a Lower Leg

6. Job Sheet #6--Position for Treatment of Shock

G. Test

H. Answers to unit test

II. References:

A. Books

1. American National Red Cross. *Standard First Aid and Personal Safety*. Garden City, New York: Doubleday, 1973.

2. Anderson, C. L. *Health Principles and Practices*. 6th ed. St. Louis, Missouri: C. V. Mosby Co., 1970.

3. Bredow, Miriam and Marian Cooper. *The Medical Assistant*. 3rd ed. St. Louis, Missouri: McGraw-Hill Book Company, 1958.

4. Schwarzrock, Shirley and James R. Jensen. *Effective Dental Assisting*. 4th ed. Dubuque, Iowa: Wm. C. Brown Co., 1975.

B. Pamphlet

1. "Emergency Measures in Cardiopulmonary Resuscitation." American Heart Association,1973.

C. Films

Available through local American Red Cross chapter, local Heart Association, or local fire department

D. Filmstrip

1. "Methods of Cardiopulmonary Resuscitation", (#329). Trainex Corp. P. O. Box 116, Garden Grove, California 92642.

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

INFORMATION SHEET

I. Introduction to first aid

  A. First aid--The immediate, temporary care given to the victim of an accident or sudden illness before the arrival of professional help.

  B. Value of first aid

    1. To self--Can care for self or direct others in first aid procedures

    2. To others--Can assist others

    3. To community--Can administer first aid in disaster or catastrophe

  C. Priorities in first treatment of victim

    1. Rescue--Remove from dangerous area, if necessary

    2. Respiration

    3. Bleeding

    4. Fractures

    5. Burns

    6. Poisons

    7. Foreign objects

    8. Shock

II. Cardiopulmonary resuscitation

  A. Respiratory emergency--An emergency in which normal breathing stops or is dangerously reduced

    1. Evaluation of need for resuscitation

      a. Cyanosis--Blue discoloration due to lack of oxygen

      b. Loss of consciousness

c. Cessation of breathing

2. Methods of resuscitation

a. Administer oxygen by mechanical means

b. Administer oxygen by mouth

1) Clear patient's airway

a) Check for possible obstructions in victim's mouth

b) Extend victim's head

2) Pinch victim's nostrils shut (XVI-TM-1)

3) Blow air into victim's mouth (XVI-TM-2)

4) Watch victim's chest to see when it rises

5) Continue mouth-to-mouth resuscitation at rate of 12-20 breaths/minute until victim begins to breath unaided (XVI-TM-3)

B. External cardiac compression--Consists of application of rhythmic pressure over lower half of sternum

1. Evaluation of need for external cardiac compression

a. When there is no detectable pulse

b. When patient is cyanotic

2. Procedure for external cardiac compression

a. Apply rhythmic pressure over lower half of sternum with heel of one hand placed over back of other hand

b. Continue pressure at rate of 60-80 times per minute until victim's heartbeat is restored

C. Combination of external cardiac compression with artificial breathing

1. Apply at rate of five compressions to one breath

2. Continue until help arrives

III. Wounds

A. Types of wounds

1. Abrasion--Skin scraped against hard surface

2. Puncture--Skin pierced, producing hole

3. Lacerations--Skin torn, jagged edges

4. Incision--Skin cut, smooth edges

5. Avulsion--Tissue torn from body

B. First aid treatment for wounds

1. Control bleeding

a. Direct pressure--Pressure over wound

b. Pressure points--Prssure applied where artery passes over bone

c. Constricting band--Wide strip of material used to control bleeding

2. Cover wound with dressing, depending on size, location, and type of wound

3. Transport patient to medical facility

IV. Bone and joint injuries

A. Types of injuries

1. Fracture--Bone is broken

a. Simple fracture--Break in bone; closed wound

b. Compound fracture--Break in bone, with open wound

c. Greenstick--Break on the side of bone only

d. Comminuted--Splintered fracture

2. Dislocation--Displacement of bone end from joint

3. Strain--Injury to a muscle from overstretching

4. Sprain--Tearing of soft tissue at joint

B. First aid treatment for bone and joint injuries

1. Splints--Used to immobilize body parts when fracture is suspected. Types of splints are:

a. Wooden

b. Inflatable plastic

c. Shaped plastic or aluminum

d. Improvised--Any available supportive material as a magazine or newspaper

2. Slings--Triangular bandages used to support (XVI-TM-6)

3. Ice packs--Small bags of crushed ice or a cold, wet pack

C. Back and neck injuries

1. Immobilize victim to prevent injury to spinal cord. Place padding around victim to prevent movement

2. Send for help

3. If immediate help is not available and victim must be moved,place on a firm support. Secure victim to support before transporting

V. Burns--Injuries caused by heat, chemicals, or radiation

A. Classification

1. First-degree burns--Redness or discoloration of skin

2. Second-degree burns--Redness and blisters

3. Third-degree burns--Deep tissue destruction

B. First aid treatment

1. For burns caused by heat

a. First-degree burns--Apply cold water or ice

b. Second-degree burns--Cold water followed by sterile dressing only. Seek medical help if extensive area burned

c. Third-degree burns--Cover with sterile dressing or clean household linen. Seek medical care

2. For burns caused by chemicals

a. Flush burned area with running water for at least five minutes

b. Seek medical help immediately

3. For burns caused by radiation

(Example: sunburn, radioactive materials, or x-ray)

a. Treatment for sunburn same as that for burns caused by heat

b. Seek medical help for radiation burns other than sunburn

VI. Poisons--Any substance that impairs health or causes death when taken into the body

A. Types of poisons

1. Chemical

a. Petroleum products, such as gasoline and kerosene

b. Acids, such as toilet bowl cleaners and battery acid

c. Alkalis, such as drain cleaners, detergents, and ammonia

d. Gases, such as carbon monoxide and methane

e. Others, such as bleaches, pesticides, insecticides, and weed killers

2. Plant

a. Contact, such as poison ivy, poison oak, and poison sumac

b. Ingested, such as dumb cane, oleander, toadstools, and castor beans

3. Animal
    a. Insects, such as bees, wasps, and ants
    b. Spiders, such as the brown recluse and the black widow
    c. Snakes, such as rattlesnakes, copperheads, moccasins, and coral
    d. Marine animals, such as the Portuguese man-of-war, jelly fish, and ray fish
4. Drugs--Any medicine ingested in any amount other than the prescribed dosage. Drug combinations may also be dangerous

B. First aid treatment

1. Ingested poison--Poison taken by mouth
    a. Locate container
    b. Dilute or neutralize poison
    c. Induce vomiting (unless poison is petroleum product, acid, or alkali)
    d. Maintain vital functions
    e. Seek medical assistance
2. Contact poison--Poison in contact with skin
    a. Commercial chemicals
        (1) Remove clothing, if contaminated
        (2) Flood with running water
        (3) Seek medical assistance
    b. Poisonous plants
        (1) Wash hands with soap and water
        (2) Apply soothing lotion.
3. Injected poison
    a. Insects
        (1) Cold application

(2) Soothing lotion

b. Marine animals

(1) Wash area

(2) Apply dilute ammonia or rubbing alcohol

c. Snakes

(1) Keep victim quiet and reassure him

(2) Immobilize limb--Keep limb below heart level, if possible

(3) Pack affected area in ice or ice water

(4) Place constricting band between wound and victim's heart

(5) Get medical assistance

4. Inhaled poisons

a. Move victim to fresh air

b. Check pulse and respiration

(1) Begin cardiopulmonary resuscitation, if necessary

(2) Get medical help

VII. Foreign objects

A. Objects in airway

1. Signs and symptoms

a. Violent choking with redness of face and neck

b. Cyanosis

c. Cessation of breathing

2. First aid treatment

a. Encourage coughing

b. Administer artificial respiration if breathing stops

c. Seek medical help

3. Heimlich Procedure--The removal of a foreign body from the trachea by exerting pressure under the diaphragm. The following standard procedure is used.

   a. Stand behind victim

   b. Wrap arms about the victim's waist

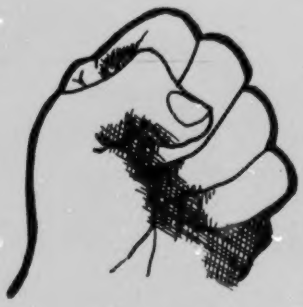
   c. Make a fist with one hand

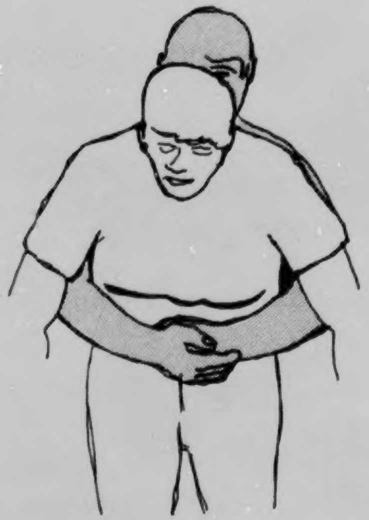
   d. Grasp the fist with the other hand

   e. Place the thumb side of the fist against the victim's abdomen, above the navel and below the rib cage

   f. Press the fist into the victim's abdomen with a quick upward thrust

   g. Repeat several times if necessary to dislodge obstruction





B. Objects in eye

1. If object is visible on inside of either lid, remove carefully with clean cloth or paper tissue.

2. Seek medical aid, if needed.

VIII. Traumatic shock--Depressed state of vital body functions

A. Signs

1. Early stages

a. Pallor and cyanosis

b. Moist, clammy skin

c. Rapid, weak pulse

d. Increased respiration

2. Late stage

a. Dilated pupils

b. Fainting and loss of consciousness

c. Possible death if untreated

B. First aid treatment

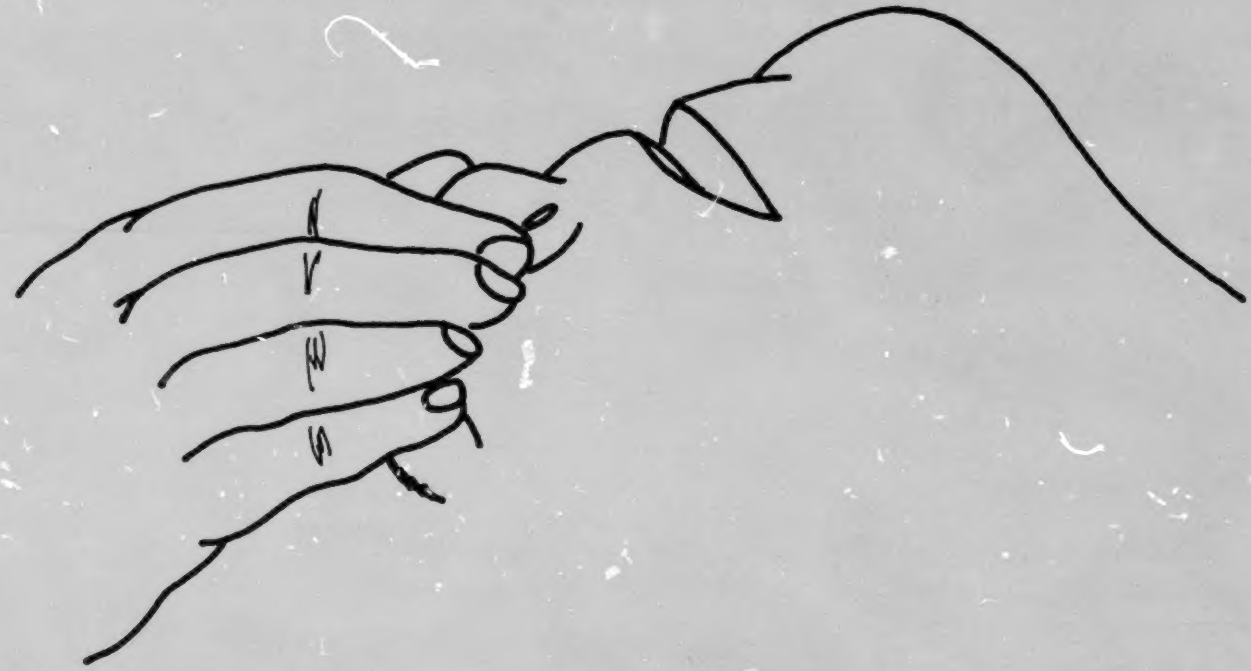
1. Keep victim lying down

2. Cover to prevent loss of body heat

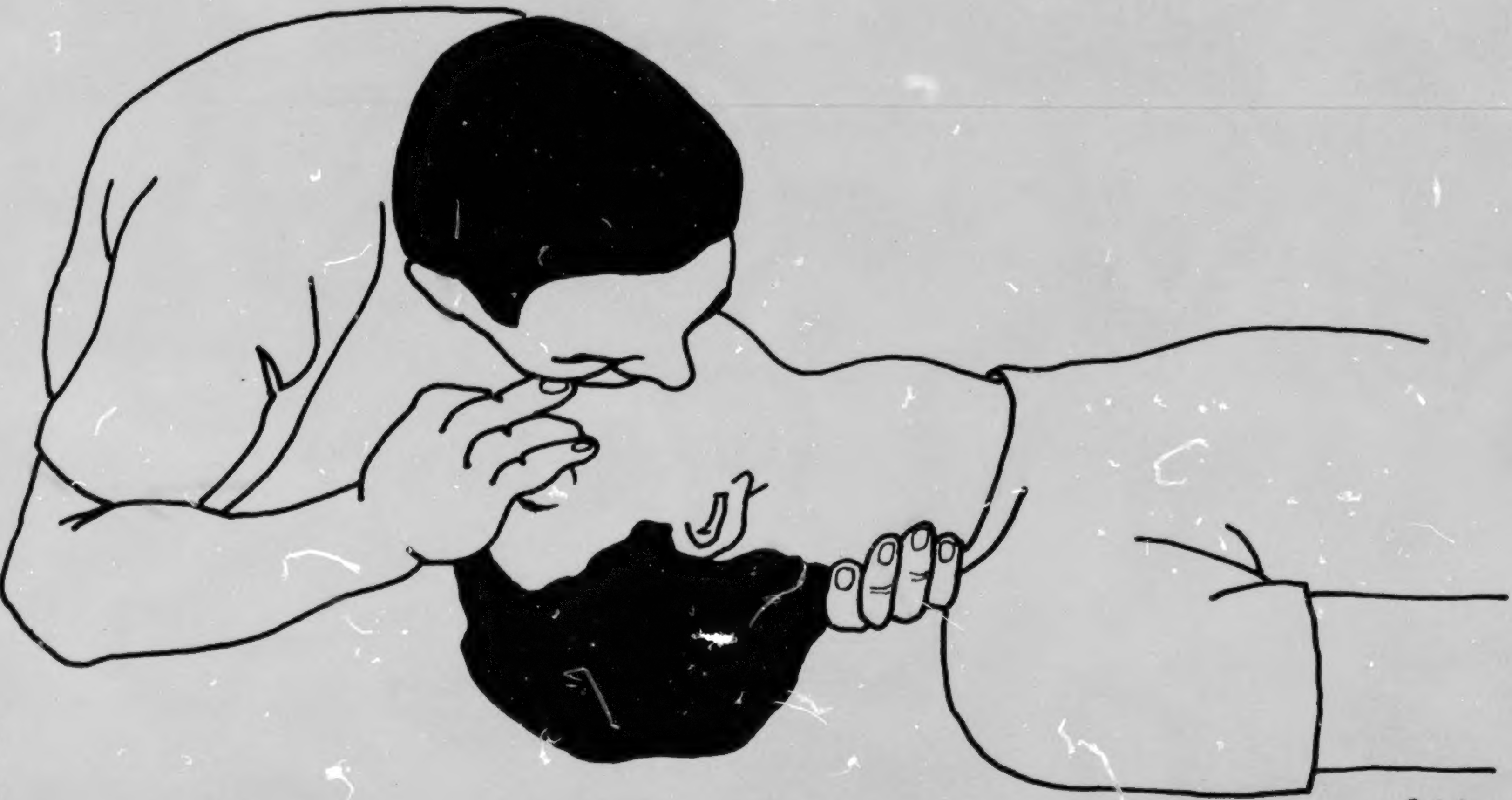
3. Elevate feet slightly

4. Seek medical aid

PINCHING NOSE



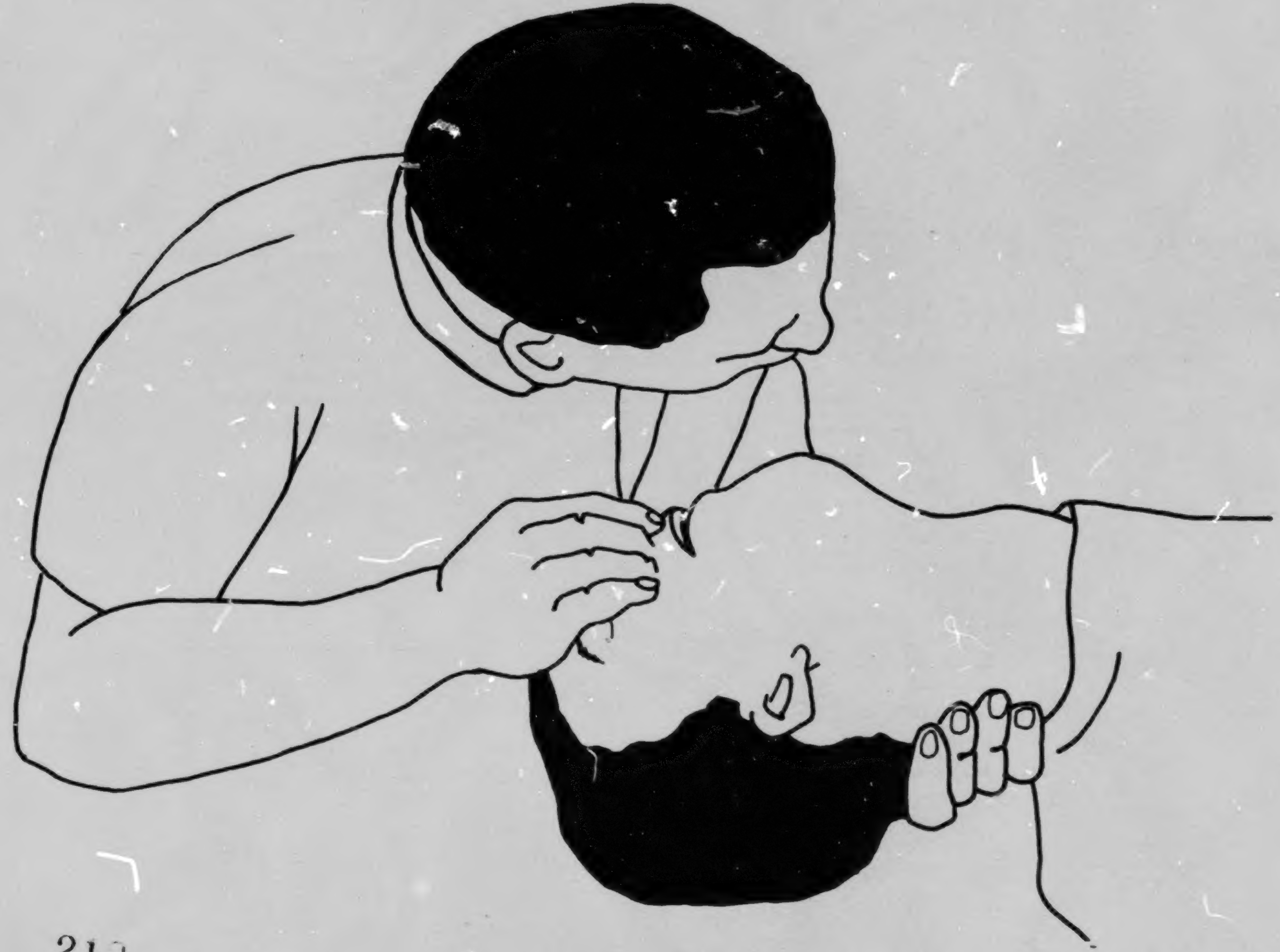
BREATHING INTO MOUTH



XVI-TM-2

XVI-19

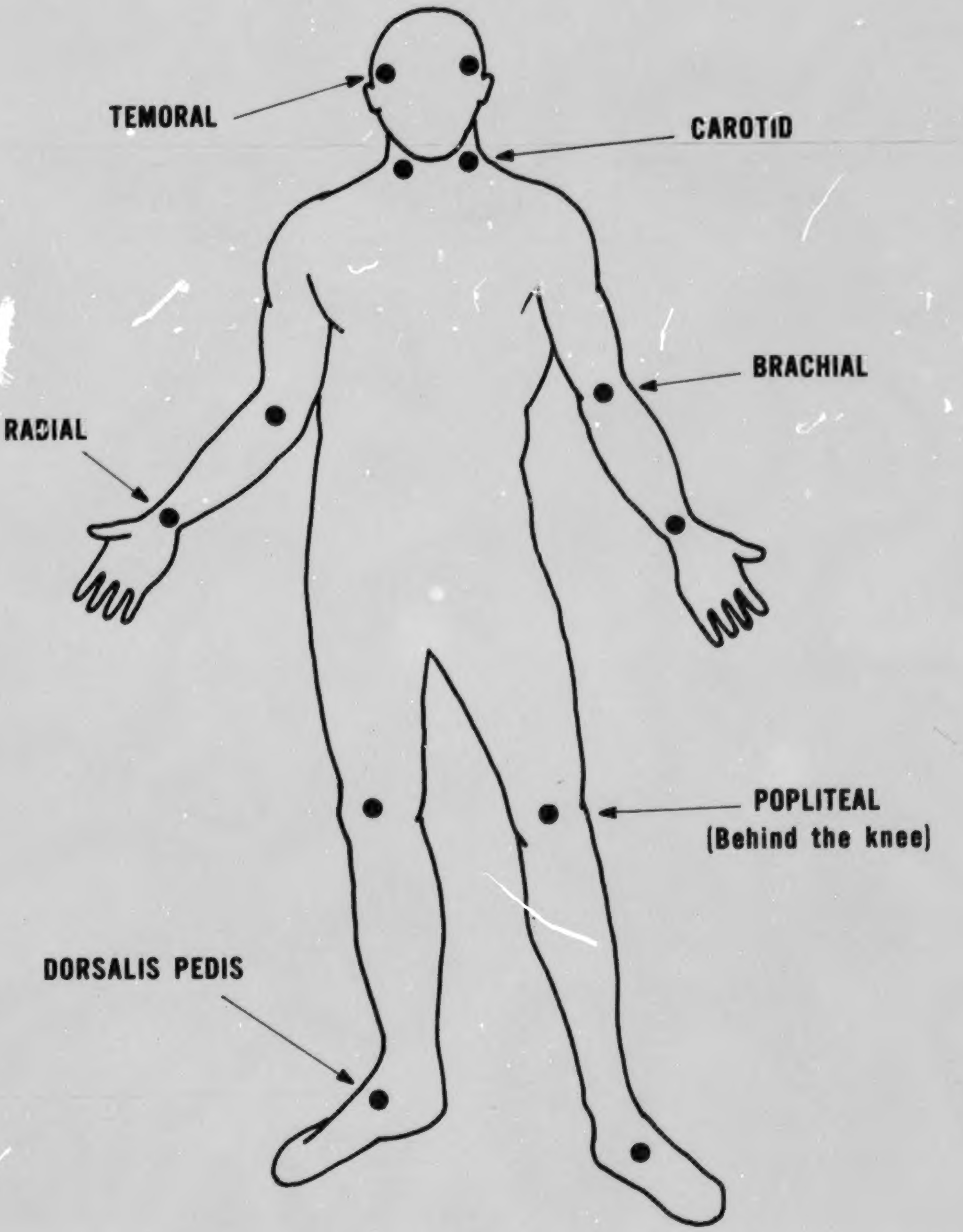
LISTENING FOR RETURN OF AIR



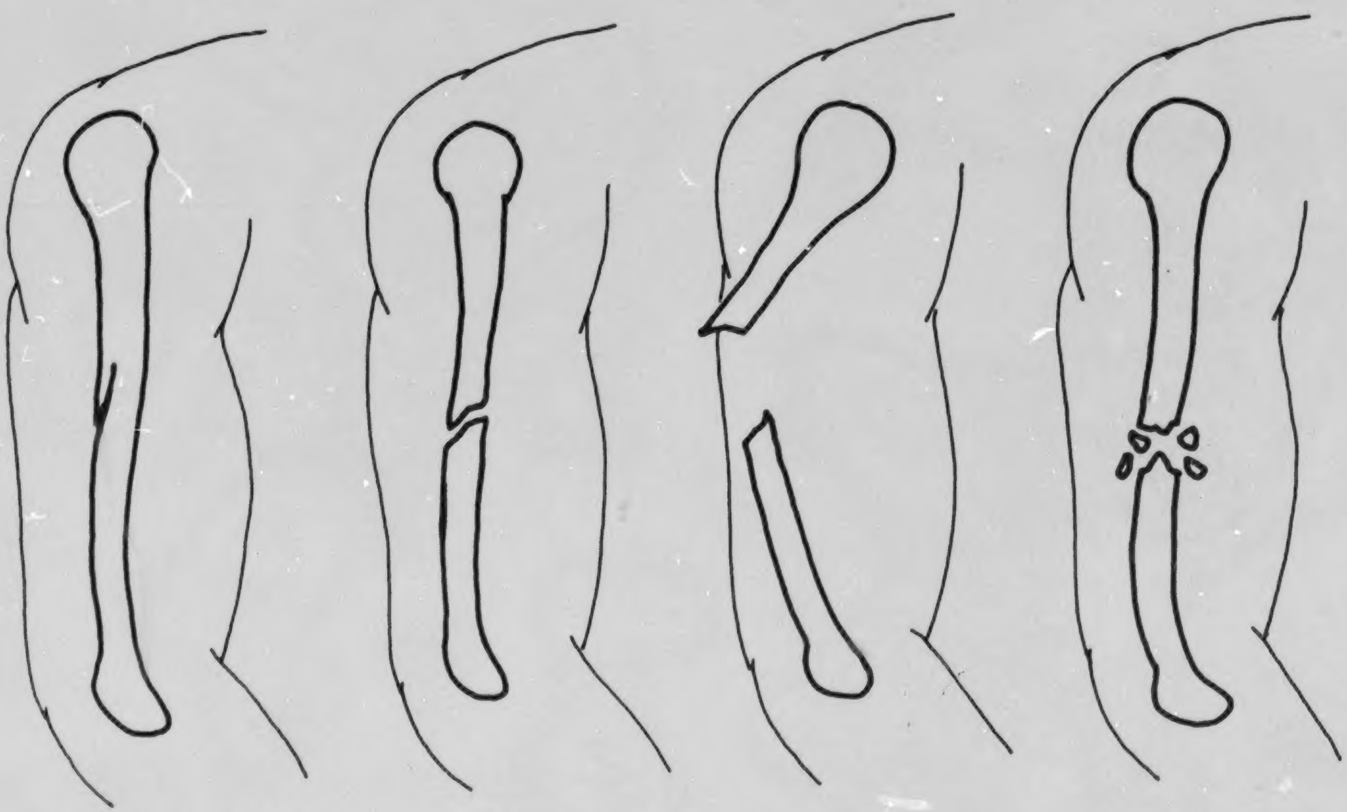
XVI-TM-3

XVI-21

PRESSURE POINTS


TEMORAL
CAROTID
BRACHIAL
RADIAL
POPLITEAL
(Behind the knee)
DORSALIS PEDIS

TYPES OF FRACTURES



GREEN STICK

COMPLETE (Simple)

COMPLETE (Compound)

COMMINUTED

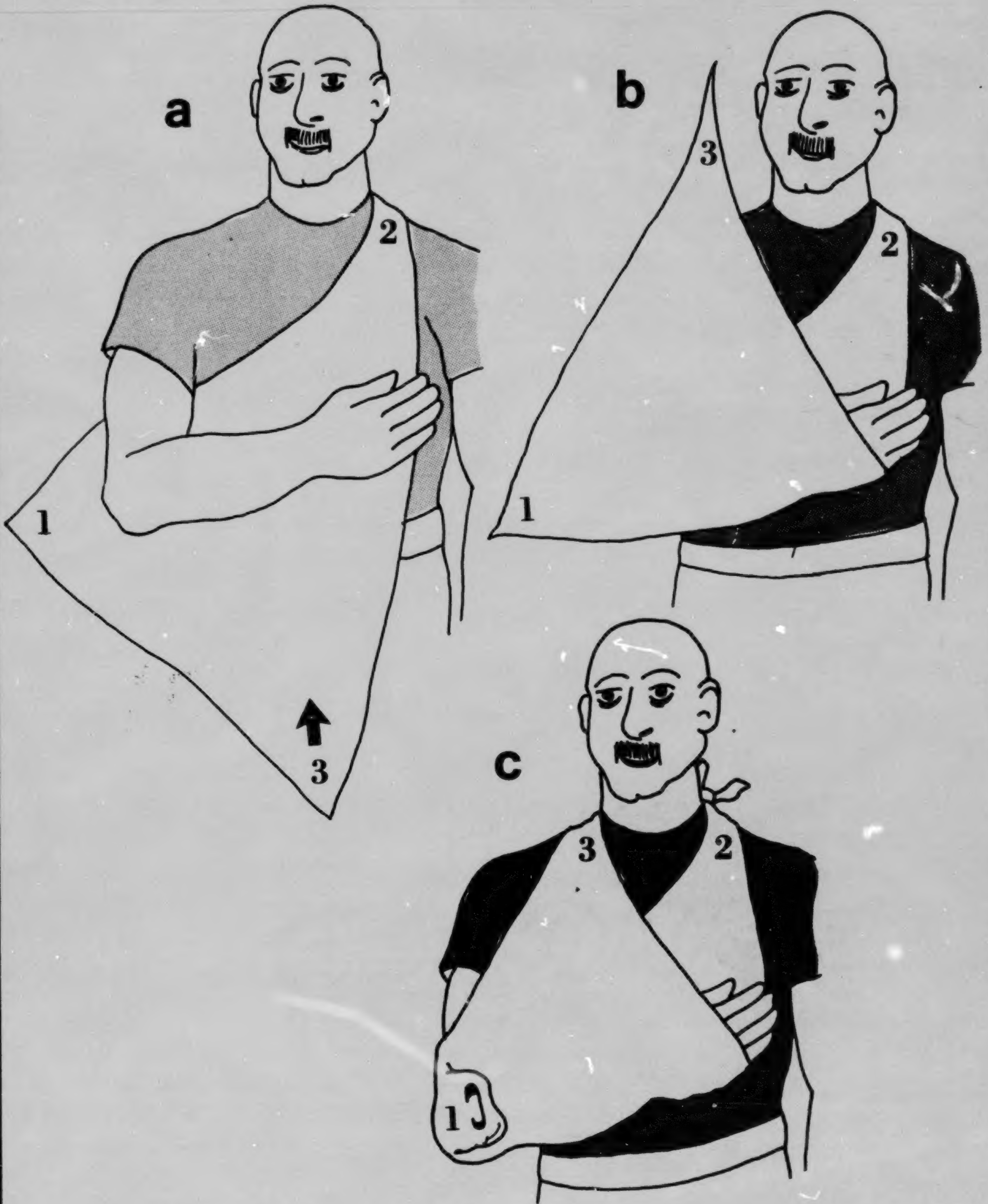
XVI-TM-5

215

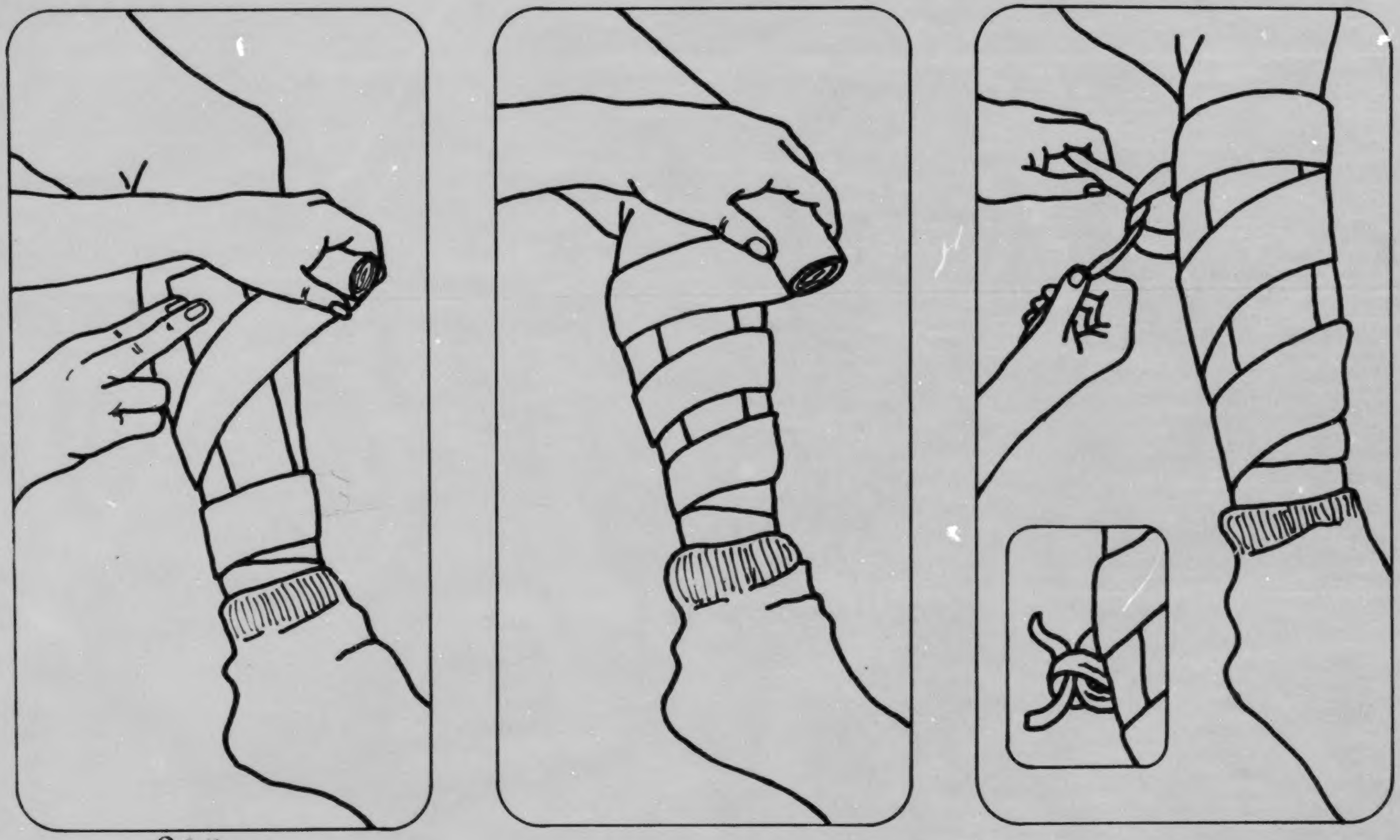
216

XVI-25

MAKING A SLING


a
2
1
3
b
3
2
1
c
3
2
1

SPIRAL BANDAGE OF LIMB



UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

ASSIGNMENT SHEET #1--SOURCES OF FIRST AID MATERIALS

Directions:

1. List five items that could be used for splints.

2. List five items that could be used for bandages.

3. How do you apply direct pressure if you don't have anything to use as a dressing?

4. What three items could be used as a constricting band?

5. List three items that could be used to elevate victim's feet in suspected shock.

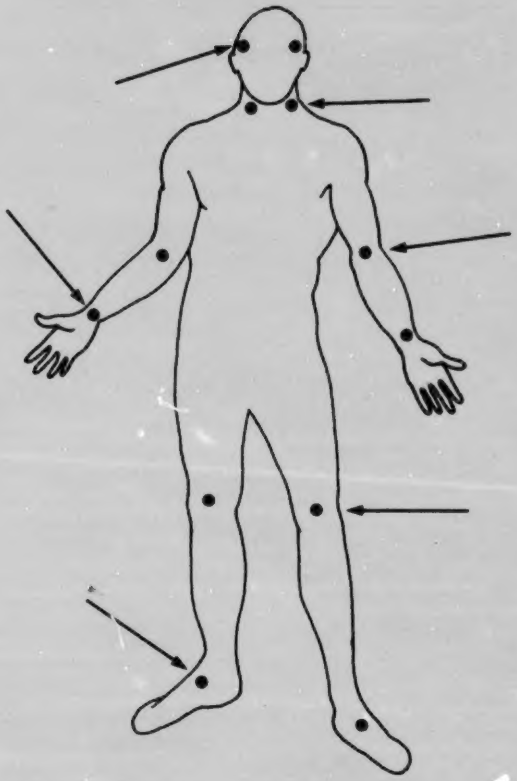
UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

ASSIGNMENT SHEET #2--CONTROL OF BLEEDING-PRESSURE POINTS

Directions:

1. Label pressure points on diagram.



2. Name pressure points to be used in control of bleeding of following areas:

   a. Left forearm

   b. Right upper arm

   c. Lower left leg

   d. Palm of right hand

   e. Lower left jaw

   f. Forehead

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

ASSIGNMENT SHEET #3--IDENTIFICATION OF BURNS

Directions: Complete the following chart.

Types of Burns	Description	First Aid Treatment
1st degree		
2nd degree		
3rd degree		

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

ASSIGNMENT SHEET #4--BURNS--CAUSES, DEGREES, AND PREVENTION

Directions: Prepare poster for class display using one of the following topics.

1. Causes of burns
2. Degrees of burns
3. Prevention of burns

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

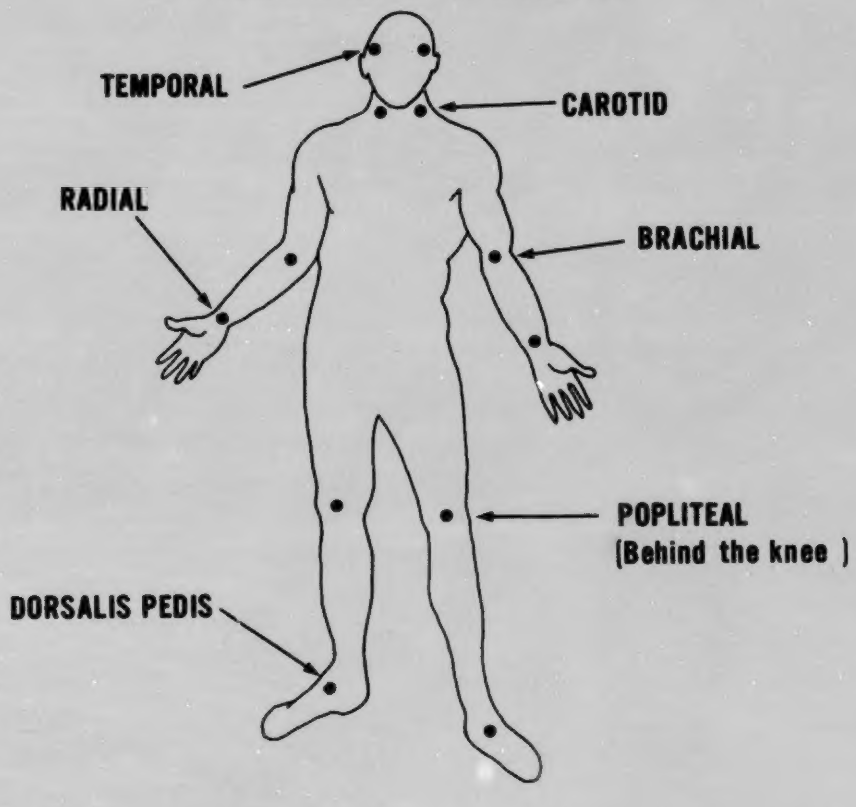
ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

1. Rolled newspaper, magazine, wooden slat, tree limb, umbrella, baseball bat, oar, etc.
2. Necktie, handkerchief, scarf, sheet, towel, hose, torn strips of clothing, etc.
3. Use bare hand.
4. Hose, tie, belt, strips of clothing, etc.
5. Pillow, folded blanket, cardboard carton, books, log, etc.

Assignment Sheet #2

1. **PRESSURE POINTS**


TEMPORAL
CAROTID
RADIAL
BRACHIAL
POPLITEAL
(Behind the knee)
DORSALIS PEDIS

2. a. Left brachial
   b. Right brachial
   c. Left femoral
   d. Right radial
   e. Left carotid
   f. Temporal

Assignment Sheet #3

Types of Burns	Description	First Aid Treatment
1st degree	Redness of skin	Apply ice or cold water
2nd degree	Blistering of skin	Immerse in cold water. Cover with clean or sterile dressing. Seek medical care if extensive
3rd degree	Destruction of skin and underlying tissue	Cover with sterile or clean cloth. Seek medical attention

Assignment Sheet #4

Evaluated to the satisfaction of the instructor.

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

JOB SHEET #1--PERFORMANCE OF CARDIOPULMONARY RESUSCITATION

I. Tools and equipment needed:

"Resusci-ann" mannequin (from local Red Cross or Heart Association)

II. Job Procedures:

A. Position mannequin on floor

B. Kneel at right side of mannequin at chest area

C. Hyperextend "victim's" neck

D. Look--to see if breathing (chest rising)

E. Feel--for pulse

F. Listen--for air

G. Clear mouth and throat, if needed

H. Pinch nose

I. Make airtight seal with your mouth over victim's mouth

J. Give victim two quick breaths--chest should rise

K. Permit expiration

L. If no pulse is felt, place heel of one hand over back of other hand or lower half of victim's sternum

M. Apply pressure over heart, keeping elbows straight

N. Make five compressions and return for one breath to victim

O. Continue at the ratio of five compressions to one breath until help arrives

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

JOB SHEET #2--CONTROL BLEEDING OF WOUND IN FOREARM

I. Tools and equipment needed:

   A. Compress or gauze square

   B. Constricting band

   C. Dowel or windlass

II. Job Procedures:

   A. Place victim in comfortable position

   B. Locate wound in forearm

   C. Stop bleeding

      1. Apply pressure to wound using compress or gauze square.

      2. Apply pressure to brachial artery. Press artery against bone of inner arm midway between elbow and armpit.

      3. Apply constricting band around upper arm. Tie, using square knot. Place dowel on knot. Tie second square knot and twist to constrict artery. Do not cut off circulation completely. Check hand for blue color.

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

JOB SHEET #3--APPLYING A SPIRAL TURN BANDAGE TO A FOREARM

I. Tools and equipment needed:

- A. 2" roller bandage
- B. Gauze dressings
- C. Scissors

II. Job Procedures:

- A. Place patient in comfortable position
- B. Locate injury
- C. Place dressing over injury
- D. Elevate limb
- E. Make a complete turn of roller bandage at wrist. Spiral bandage upward to cover dressing. Split last six inches of bandage, tie knot, wrap both ends of split bandage around arm, and tie

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

JOB SHEET #4--SPLINTING A FRACTURE OF A FOREARM

I. Tools and equipment needed:

   A. Splint

   B. Bandages

      1. Roller

      2. Sling

II. Job Procedures:

   A. Locate fracture

   B. Apply splint. Use one or two splints as needed

   C. Hold splint or splints by roller bandages

   D. Place splinted forearm in sling

   E. Fasten sling around neck to support splinted forearm

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

JOB SHEET #5--SPLINTING A FRACTURE OF A LOWER LEG

I. Tools and equipment needed:

  A. Splints

  B. Bandages

  C. Padding for splints

II. Job Procedures:

  A. Locate fracture

  B. Pad splints

  C. Apply splints to outer and inner sides of lower leg

  D. Be sure that splints extend beyond knee and ankle joints

  E. Hold splints by bandages

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

JOB SHEET #6--POSITION FOR TREATMENT OF SHOCK

I. Tools and equipment needed:

  A. Blanket (cover)

  B. Pillow or folded blanket to elevate feet

II. Job Procedures:

  A. Place victim in comfortable, reclining position

  B. Cover

  C. Elevate feet 8-12 inches

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

UNIT TEST

1. a. Define first aid

   b. List the first three priorities in first aid treatment of victim after rescue.

2. In CPR, give the ratio of compressions to breaths.

3. Define the following terms:

   a. Abrasion

   b. Puncture

   c. Laceration

   d. Incision

   e. Avulsion

4. a. Define:

   1. Strain

2. Sprain

3. Dislocation

4. Greenstick fracture

5. Comminuted fracture

6. Compound fracture

7. Simple fracture

b. Explain why a patient with suspected back or neck injuries should be immobilized.

5. a. Identify the three main causes of burns.

1.

2.

3.

b. Give the first aid treatment for the following burns caused by heat.

1. First-degree burns ____________________

____

2. Second-degree burns ____________________

____

3. Third-degree burns ____________________

____

6. a. Using letter answers, match the treatments with types of poisons.

_____1. Flood with water

_____2. Wash with soap and water

_____3. Pack in ice

_____4. Apply dilute ammonia

_____5. Move to fresh air

_____6. Dilute poison and/or induce vomiting

_____7. Apply soothing lotion

a. Inhaled gas

b. Insect sting

c. Marine animals

d. Ingested poisons

e. Commerical chemicals

f. Poisonous plants (contact)

g. Poisonous snakes

b. Describe the circumstances under which prescribed drugs could be dangerous.

c. List in order the steps to be taken in cases of ingested poisoning.

1.

2.

3.

4.

5.

7. Identify signs and symptoms of choking.

8. a. Define traumatic shock.

b. List four signs of early shock.

c. Give three steps in treatment of shock.

9. List sources of first aid materials

10. Label diagram of pressure points from transparency.

11. Name pressure points to be used for control of bleeding of given areas.

12. Complete chart describing types of burns and their treatment.

13. Prepare poster showing causes, degrees, or prevention of burns.

14. Demonstrate the ability to:

    a. Perform cardiopulmonary resuscitation

    b. Control bleeding of wound

    c. Apply a spiral turn bandage

    d. Splint a fracture of a forearm

    e. Splint a fracture of a lower leg

    f. Position victim for treatment of shock

    (NOTE: If these skills, #9-#16, have not been accomplished prior to the test, ask the instructor when they should be completed.)

UNIT XVI

GIVING STANDARD FIRST AID TREATMENT

ANSWERS TO UNIT TEST

1. a. The immediate, temporary care given to the victim of an accident or sudden illness before the arrival of professional help

   b. Respiration
      Bleeding
      Fracture

2. 5 to 1

3. a. Skin scraped against hard surface

   b. Skin pierced, producing hole

   c. Skin torn, jagged edges

   d. Skin cut, smooth edges

   e. Tissue torn from body

4. a. (1) Injury to the muscle from overstretching

      (2) Tearing of soft tissue at joint

      (3) Displacement of bone end from joint

      (4) Break on one side of bone only

      (5) Splintered fracture

      (6) Break in bone with open wound

      (7) Break in bone; closed wound

   b. To prevent injury to spinal cord

5. a. Heat
      Chemicals
      Radiation

   b. First-degree burn: Redness of skin; apply ice or cold water

      Second-Degree burn: Redness and blisters; cold water, clean dressing

Third-degree burn: Destruction of tissue, cover with clean cloth or sheet, seek medical care

6. a. e 1.

f 2.

g 3.

c 4.

a 5.

d 6.

b 7.

b. When ingested in any amount other than the prescribed dosage or in combination with other drugs

c. 1) Locate container

2) Dilute or neutralize poison

3) Induce vomiting (unless poison is petroleum product, acid, or alkali)

4) Maintain vital functions

5) Seek medical assistance

7. Redness of face
Cyanosis
Cessation of breathing

8. a. Depressed state of body functions

b. Pallor and cyanosis
Moist, clammy skin
Rapid, weak pulse
Increased respiration

c. Keep victim lying down
Cover to prevent loss of body heat
Elevate feet 8-12 inches

9.-14. Evaluated to the satisfaction of the instructor.

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

UNIT OBJECTIVE

After completing this unit, the student will be able to trace the historical development of the metric system, identify terms, recognize symbols, and define common metric prefixes and root words associated with this system of measurement. This knowledge will be evidenced through demonstration and by successfully completing a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Explain briefly the history of the metric system
2. Discuss some advantages in using the metric system
3. Observe common metric prefixes and root words
4. Identify the basic metric symbols
5. Identify rules of notation
6. Explain the five types of basic metric measurement
7. Relate facts in conversion of metric measurements to English measure
8. Read and interpret a conversion chart
9. Recognize and use metric terms, units, and symbols used in Health Occupations Education
10. Recognize and use metric equivalents in Health Occupations
11. Use instruments, tools, and devices for measurement tasks in Health Occupations Education (HOE)
12. Identify and use metric and customary units interchangeably in ordering, using products, and supplies in Health Occupations Education
13. Complete a variety of exercises in utilizing the metric system

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

SUGGESTED ACTIVITIES

I. Instructor

- A. Provide objective sheet
- B. Provide information and assignment sheets
- C. Discuss objective sheets
- D. Pass out information sheets
- E. Discuss information and assignment sheets
- F. Passout assignment sheets and, explain directions
- G. Make transparencies
- H. Discuss metric charts
- I. Give test and evaluate results

II. Student

- A. Read and discuss objective sheet
- B. Read information sheets
- C. Complete assignment sheets
- D. Interpret metric charts
- E. Take part in class discussion
- F. Bring to class examples of how metrics can be used in various health occupations

III. Included in this unit

- A. Objective sheet
- B. Information sheets
- C. Transparency masters
  - 1. XVII-TM-1--Equivalent Chart
  - 2. XVII-TM-2--Conversion Chart

3. XVII-TM-3--Table of Metric Measurements
4. XVII-TM-4--Tables of Data
5. XVII-TM-5--Metric--Customary Equivalent

D. Assignment sheets

1. Assignment Sheet #1--Prefixes, Symbols and Values
2. Assignment Sheet #2--Length
3. Assignment Sheet #3--Record the Actual Length
4. Assignment Sheet #4--Estimating and Measuring the Length of Items in Millimeters
5. Assignment Sheet #5--Finding the Area of a Rectangle
6. Assignment Sheet #6--Identifying Volume
7. Assignment Sheet #7--Identifying Volume and Capacity in Cubic Centimeters
8. Assignment Sheet #8--Determining Units of Mass in Measuring Particular Articles
9. Assignment Sheet #9--Determining Mass and Weight
10. Assignment Sheet #10--Converting Temperatures--Both Celsius and Fahrenheit
11. Assignment Sheet #11--Converting Yards, Miles, and Pounds
12. Assignment Sheet #12--Comparison of the Metric System to English System
13. Assignment Sheet #13--Converting a Value in One System to the Corresponding Value in the Other
14. Assignment Sheet #14--Converting the Metric Equivalents Exercise
15. Assignment Sheet #15--Converting Milliliters to Liters Exercise
16. Assignment Sheet #16--Converting Liters to Milliliters Exercise

17. Assignment Sheet #17--Converting Grams to Kilograms Exercise

18. Assignment Sheet #18--Converting Kilograms to Grams Exercise

19. Assignment Sheet #19--Changing Units to Work

20. Assignment Sheet #20--Metric Grid

21. Assignment Sheet #21--Any Way You Want It

22. Assignment Sheet #22--Which Tool for the Job

23. Assignment Sheet #23--Converting Metric Measurement to Customary Units

24. Assignment Sheet #24--Complete a Requisition Form

E. Answers to the Assignments Sheets

F. Unit Test

G. Answers to Unit Test

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UNIT XVII

METRIC FOR HEALTH OCCUPATIONS

INFORMATION SHEET

I. History of the metric system

   A. First proposed in 1670 by Gabriel Mouton, Vicar of St. Paul, Lyons, France, who saw the need of a different unit of measurement

   B. After 100 years elasped, the national assembly of France in 1790 requested the metric system

   C. The metric system has a base of ten

   D. All other units are a power of ten times this base unit

   E. The metric system was officially adopted in France in 1840

   F. During the 19th century the metric system became the primary system. It was adopted by most of the other European nations, and presently it is officially used in more than 130 countries.

   G. In 1866 an act of Congress legalized the metric system as a secondary system of weights and measures in the United States

   H. In 1960, the Eleventh General Conference on Weights and Measurement met in Paris, the conference adopted the system international d' units with the international abbreviation SI. The metric system is sometimes referred to as the international system (SI)

II The advantages of using the metric system

   A. Used by most nations in the world and is becoming the universal language of measurement

   B. Simply stated and the units are logically related to immutable standards

   C. Eliminates confusion concerning mass, force, and weight

   D. Easy to use

E. Could stimulate the economy by standardizing all units of measure

F. Could improve communication among the world's people

G. Convenient to use in health-related occupations

H. Decimally constructed, conforming to the U.S. Monetary system

I. Would increase exports to those countries using metric system

J. Could competitively put the United States at a disadvantage because most great industrial countries use the metric system

III. Common metric prefixes and root words

A. Kilo--thousand, a kilo is one thousand (10^3) meters

B. Hecto--hundred, a hecto is one hundred (10^2) meters

C. Deca--ten, a decameter is the (10^1) meters

D. Deci -a work element which means one-tenth ($0.1=10^{-1}$) of a meter

E. Centi-a word element which means one-hundredth ($0.01=10^{-2}$) of a meter

F. Mili-a word element which means one-thousandth ($0.001=10^{-3}$) of a meter

IV. The basic metric symbols (Note: Liter and meter also can be spelled litre and metre, but this is the British form.)

A. mm--Millimeter

B. cm--centimeter

C. m--meter

D. Km--kilometer

E. cm^2--square centimeter

F. m^2--square meter

G. ha--hectare

H. ml--milliliter

I. l--liter

J. cm^3--Centimeter

K. m^3--cubic meter

L. mg--milligram

M. g--gram

N. kg--kilogram

O. t--metric ton

V. Rules of notation

A. Symbols are not capitalized unless the unit is a a proper name (mm not MM).

B. Symbols are not followed by periods (m not m.).

C. Symbols are not followed by an s for plurals (25 g not 25 gs).

D. A space separates the numerals from the unit symbols (4 l not 4l).

E. Spaces, not commas, are used to separate large numbers into groups of three digits (45 271 km not 45,271 km).

F. A zero precedes the decimal point if the number is less than one (o.52 g not .52 g).

G. If dual dimensions are used, show the nonmetric unit in parentheses 23 cm (9.06 in.).

H. Common use values should be rounded off rather than quoted in precise figures unless there is a definite need of exact measurements. Height is listed as 162 cm, not as 162.13 cm.

I. Use the correct capital and lower case letter for unit and multiple unit symbols.
k for kilo, K for Kelvin
m for meter, M for Mega

VI. Five types of basic metric measurements

A. Length

1. The meter is the base unit for measuring length and distance in the metric system.

2. The meter is divided into multiples and submultiples of 10.

3. Common metric units of length or distance are shown in the table below.

Basic Unit Meters (m)

Common Multiples	Common Submultiples
deka (da)=10	deci (d)=0.1 or 1/10
1 dekameter (dam)=10 meters	1 decimeter (dm)=0.1 or 1/10 meter
hecto (h)=100	
1 hectometer (hm)=100 meters	centi (c)=0.01 or 1/100 meter
kilo=100	
1 kilo (km)=1000 meters	mili (m)=0.001 or 1/1000
	1 milimeter (mm)=0.001 or 1/1000 meter

B. Area

1. Area is determined by finding the number of units contained within a figure or object.

2. Area is always expressed in square units, such as square meters, square decimeters, or square centimeters.

3. When abbreviating a square measure in the metric system, such as square centimeters, it is usually written in the form cm^2.

4. The exponent 2 is used to indicate square.

5. Metric units of area are shown on the next page.

Common Metric Units of Area

square meters	m^2
square decimeters	dm^2
square centimeters	cm^2
square millimeters	mm^2
square kilometers	km^2

C. Volume or capacity

1. The volume of a figure or object refers to the numbers of cubic units it contains.

2. In the metric system the basic unit for determining volume is the cubic meter (m^3).

3. When abbreviating a cubic measure such as cubic meter, it is usually written in the form m^3.

4. The exponent 3 is sometimes used to indicate a cubic measure.

5. Occasionally, a cubic measure will be expressed as "cc" for cubic centimeters, or even "cu cm".

6. The preferred SI form is the use of the exponent 3.

Common Metric Units of Volume

cubic meter	m^3
cubic decimeter	dm^3
cubic centimeter	cm^3
cubic millimeter	mm^3

To find the volume of a rectangular solid, multiply:

$$V = l \times w \times h$$

Volume=length x width x height

D. Mass

1. The mass of an object is a measure of the amount of matter in the object.
2. The amount is always the same unless you add or subtract some matter from the object.
3. Weight is the term that most people use when they are referring to mass.
4. The weight of an object is affected by gravity. The mass of an object is not.
5. The metric system does not measure weight; it measures mass.

Base Unit Kilogram (kg)

1 kilogram=1000 grams

Multiples

gram (g)
1 gram = 1 gram

dekagram (dag)
1 dekagram=10 grams

hectogram (hg)
1 hectaogram=100 grams

decigram=0.1 or 1/10 grams

centigram (cg)
1 centigram=0.01 or 1/100 grams

milligram (mg)
1 milligram=0.001 or 1/1000 grams

1 metric ton (l)=1000 kilograms

E. Temperature

1. The SI base unit for temperature is the Kelvin. Its symbol is a capital K.
2. On the Kelvin scale, water freezes at 273.15 K and boils at 373.15 K. This provides a temperature interval from freezing to boiling of 100 K.
3. The Kelvin scale is used primarily by scientists for precision measurement of temperature.
4. This is not a practical scale to use for common temperature measurements.

5. The Celsius scale, based on the Kelvin, is used as the common metric measure of temperature.

6. The symbol for Celsius is C and is referred as degree Celsius (°C).

7. One degree Celsius, formerly called centigrade, is equal to exactly one Kelvin.

8. On the Celsius scale, water freezes at 0 °C and boils at 100 °C.

9. The range from freezing to boiling is exactly 100 °C or 100 K. Thus the relationship is established between the Kelvin scale and the Celsius scale.

10. For a conversion from Celsius to Kelvin, add 273.15 to the Celsius value (K = C + 273.15).

Common Celsius Temperatures and their Fahrenheit Equivalents

0°C	Freezing point of water	32°F
10°C	A warm winter day	50°F
20°C	A mild spring day	68°F
30°C	A warm summer day	86°F
37°C	Body temperature	98.6°F
100°C	Boiling point of water	212°F

VII. Facts in conversion of metric measurement to English measures

A. To change meters into yards, multiply the number of meters by 1.1 (this number is approximate).

B. To change from kilometers to miles, multiply the number of kilometers by .6 (this number is approximate).

C. To change kilogram to pounds, you must multiply the number of kilograms by 2.2 (this number is approximate).

VIII. Interpreting the conversion chart. (see TM-4).

A. Two methods

1. Factor-label method in which unit factors (ratios equal to one) are multiplied and labels cancelled leaving the desired unit.
2. The Algebraic method, in which the algebraic equation is set up and solved.

B. Utilizing techniques for conversion (Example: 2 m = 200 cm)

1. Factor-label method--(using TM-4)

$$2\ \cancel{m} \times \frac{100\ cm}{1\ \cancel{m}} = \frac{200\ cm}{1} = 200\ cm$$

2. Algebraic method--(using TM-4)

$$X: 2\ m = 100\ cm : 1\ \cancel{m}$$
$$2x = 100\ cm$$
$$x = 100\ cm$$

IX. Metric terms, units, and symbols used in Health Occupations Education

METRIC UNITS FOR HEALTH OCCUPATIONS

Quantity	Unit	Symbol	Use
Linear dimensions	centimeter	cm	Orthopedic ropes, anatomical part, height/ length of patient
	millimeter	mm	Anatomical measurement, linens for bed protection
Square dimensions	square centimeter	cm^2	Linens, disposable/bed protectors
Fluid flows	milliliters	ml/min	Article decontamination, drainage collection
Mass	gram	g	Body mass, food portions
	kilogram	kg	Body mass, ortopedic weight
*Volume and capacity	cubic centimeter	cm^3 (cc.)	I and O measurements, bodily secretions, dietary containers
	milliliter	ml	I and O measurements, bodily secretions, dietary containers
	liter	l	I and O measurements
Temperature	degree Celsius	°C	Body temperature, baths, sterilization

*Note: Medical symbol for cubic centimeter will probably remain cc. (cm^3). Also, cubic centimeter (cc). and milliliter (ml) will be used interchangeably.

X. Using metric equivalents in Health Occupations Education

A. Meters, Centimeters, and Millimeters

1. There are 100 centimeters in one meter; thus

   2 m = 2 x 100 cm = 200 cm
   3 m = 3 x 100 cm - 300 cm
   36 m = 36 x 100 cm = 3600 cm

2. There are 1000 millimeters in one meter; so

   2 m = 2 x 1000 mm = 2000 mm
   3 m = 2 x 1000 mm = 3000 mm
   24 m = 24 x 1000 mm = 2400 mm

3. Note: ½ of a meter can be written 0.5 m (five-tenth of a meter.) ¼ of a centimeter can be written 0.25 cm (twenty-five hundredths of a centimeter.)

4. This means that if you want to change three-fourths of a meter to millimeters, you would multiply by 1000. So,

$$\begin{aligned} 0.75 \text{ m} &= 0.75 \times 1000 \text{ mm} \\ &= \frac{75}{100} \times 1000 \text{ mm} \\ &= \frac{75}{75} \times \frac{1000}{100} \text{ mm} \\ &= 750 \text{ mm} \end{aligned}$$

This means that 0.75 mm= 750 mm

B. Milliliters to Liters

1. There are 1000 milliliters in one liter. This means that

   2000 milliliters is the same as 2 liters.
   3000 milliliters is the same as 3 liters.
   12000 milliters is the same as 12 liters.

2. Since there are 1000 milliliters in each liter, one way to change milliliters to liters is to divide by 1000. For Example:

$$1000 \text{ ml} = \frac{1000}{1000} \text{ liter} - 1 \text{ liter}$$

or

$$2000 \text{ ml} = \frac{2000}{1000} = 2 \text{ liters}$$

and as a final example:

$28000 \text{ ml} = \frac{28000}{1000} \text{ liters} = 28 \text{ liters}$

Change 57 milliliters to liters

$57 \text{ ml} = \frac{57}{1000} \text{ liters} = 0.057 \text{ liters}$

(Fifty-seven thousandths of a liter)

3. One-half of a meter can be written 0.5m (five-tenths of a meter.) One-fourth of a centimeter can be written 0.25 cm (twenty-five hundredths of a centimeter)

4. If you want to change three-fourths of a meter to millimeters, you would multiply by 1000. So,

$$\begin{aligned} 0.75 \text{ m} &= 0.75 \times 1000 \text{ mm} \\ &= \frac{75}{100} \times 1000 \text{ mm} \\ &= \frac{75}{75} \times \frac{1000}{100} \text{ mm} \\ &= 750 \text{ mm} \end{aligned}$$

This means that o.75 m = 750 mm

C. Liters to Milliliters

1. To change liters to millimeters, it is important to remember that there are 1000 milliliters in one liter, or 1 liter = 1000 milliliters.

2. 2 liters = 2 x 1000 ml = 2000 ml

   7 liters = 7 x 1000 ml = 7000 ml

   13 liters = 12 x 1000 ml = 13000 ml

D. Grams to Kilograms

1. There are 1000 grams in one kilogram.

2. 2000 grams is the same as 5 kilograms.

   5000 grams is the same as 5 kilograms.

   700 grams is the same as 0.7 kilograms.

3. To change from grams to kilograms, use the same procedure for changing from milliliters to liters.

E. Kilograms to Grams

1. To change kilograms to grams, multiply by 1000.

2. 4 kg = 4 x 1000 g = 4000 g

   23 kg = 23 x 1000 g = 23000 g

   0.75 g = 0.75 x 1000 g = 750 g

XI. Suggestions when using metrics in the classroom include the following:

A. Find out in advance whether English or metric units, tools, instruments, or products are needed for a task.

B. Examine the tool or instrument before using it.

C. The metric system is a decimal system. Look for units marked off in whole numbers in multiples of 10.

D. Look for metric symbols on the tools or gages such as, m, mm, kg, etc.

E. Look for decimal fractions (0.25) or decimal mixed fractions (2.50) rather than common fractions (3/8).

F. Some products may have a special metric symbol, such as a block M, to show they are metric.

G. Don't force devices which are not fitting properly.

XII. Using metric and customary units of measurement interchangeably (Conversion Table)

A. Determine which conversion table is needed.

B. Look up the known number in appropriate column; if not listed, find numbers you can add together to make the total of the known number.

C. Read the equivalent(s) from the next column.

Equivalents Conversion Charts

Metric-English Equivalents

Approximate Values

1 mm = 0.04 inch
1 cm = 0.4 inch
1 m = 39.37 inches
1 km = 0.6 mile
1 cm^2 = 0.16 square inch
1 m^2 = 10.8 square feet
1 m^2 = 1.2 square yards
1 hectare = 2.5 acres
1 cm^3 = 0.06 cubic inch
1 m^3 = 35.3 cubic feet
1 m^3 = 1.3 cubic yards
1 ml = 0.034 ounce
1 cl = 0.34 ounce
1 l = 2.1 pints
1 l = 1.06 quarts
1 l = 0.26 gallon
1 g = 0.035 ounce
1 kg = 2.2 pounds
1 metric t = 1.1 U.S. ton

English-Metric Equivalents

Approximate Values

1 inch = 25.4 mm
1 inch = 2.54 cm
1 foot = 0.305 m
1 yard = 0.91 m
1 mile = 1.61 km
1 square inch = 6.5 cm^2
1 square foot = 0.09 m^2
1 square yard = 0.8 m^2
1 acre = 0.4 hectare
1 cubic inch = 16.4 cm^3
1 cubic foot = 0.03 m^3
1 cubic yard = 0.8 m^3
1 pint = 0.47 l
1 quart = 0.95 l
1 gallon = 3.79 l
1 ounce = 28.35 g
1 pound = 0.45 kg
1 U.S. ton = 0.9 metric ton

Conversion Chart

Metric		English
centimeters	.3937	inches
meters	1.09361	yards
kilometers	.62137	miles
liters	.2641794	gallons (U.S.)
kilograms	2.204623	pounds

English		Metric
inches	2.54	centimeters
yards	.9144	meters
miles	1.6093	kilometers
gallons (U.S.)	3.785306	liters
pounds	.453592	kilograms

Table of Metric Measurements

length		
10 millimeters (mm)	=	1 centimeter (cm)
10 centimeters (cm)	=	1 decimeter (dm)
10 decimeters (dm)	=	1 meter (m)
10 meters (m)	=	1 dekameter (dam)
10 dekameters (dam)	=	1 hectometer (hm)
10 hectometers (hm)	=	1 kilometer (km)
area		
100 square millimeters (mm^2)	=	1 square centimeter (cm^2)
100 square centimeters (cm^2)	=	1 square decimeter (dm^2)
100 square decimeters (dm^2)	=	1 square meter (m^2)
100 square meters (m^2)	=	1 square dekameter (dam^2)
100 square dekameters (dam^2)	=	1 square hectometer (hm^2)
100 square hectometers (hm^2)	=	1 square kilometer (km^2)
volume		
1000 cubic millimeters (mm^3)	=	1 cubic centimeter (cm^3)
1000 cubic centimeters (cm^3)	=	1 cubic decimeter (dm^3)
1000 cubic decimeters (dm^3)	=	1 cubic meter (m^3)
capacity		
10 milliliters (ml)	=	1 centiliter (cl)
10 centiliters (cl)	=	1 deciliter (dl)
10 deciliters (dl)	=	1 liter (l)
10 liters (l)	=	1 dekaliter (dal)
10 dekaliters (dal)	=	1 hectoliter (hl)
10 hectoliters (hl)	=	1 kiloliter (kl)
1 cubic decimeter (dm^3)	=	1 liter (l)
mass and weight		
10 milligrams (mg)	=	1 centigram (cg)
10 centigrams (cg)	=	1 decigram (dg)
10 decigrams (dg)	=	1 gram (g)
10 grams (g)	=	1 dekagram (dag)
10 dekagrams (dag)	=	1 hectogram (hg)
10 hectograms (hg)	=	1 kilogram (kg)
1 cubic decimeter (dm^3)	=	1 liter (l) = 1 kilogram (kg)

Tables of Data

Units of Length

Millimeters			Centimeters	Inches	Feet	Yards	Meters
1 mm.	=	1.0	0.1	0.03937	0.00328	0.0011	0.001
1 cm.	=	10.0	1.0	0.3937	0.03281	0.0109	0.01
1 in.	=	25.4	2.54	1.0	0.0833	0.0278	0.0254
1 ft.	=	304.8	30.48	12.0	1.0	0.333	0.3048
1 yd.	=	914.40	91.44	36.0	3.0	1.0	0.9144
1 m.	=	1000.0	100.0	39.37	3.2808	1.0936	1.0

1μ = 1 mu = 1 micron* = 0.001 millimeter. 1 mm. = 1000μ.
1 km. = 1 kilometer = 1000 meters = 0.6215 mile.
1 mile = 5280 feet = 1.609 kilometers.
1 Micron is also called micrometer, μm = 10^{-6}

Units of Volume (fluid or liquid)

Milliliters			U.S. Fluid Drams	Cubic Inches	U.S. Fluid Ounces	U.S. Fluid Quarts	Liters
1 ml.	=	1.0	0.2705	0.061	0.03381	0.00106	0.001
1 fl. ʒ	=	3.697	1.0	0.226	0.125	0.00391	0.00369
1 cu. in.	=	16.3866	4.4329	1.0	0.5541	0.0173	0.01639
1 fl. ℥	=	29.573	8.0	1.8047	1.0	0.03125	0.02957
1 qt.	=	946.332	256.0	57.75	32.0	1.0	0.9463
1 L.	=	1000.0	270.52	61.025	33.815	1.0567	1.0

1 gallon = 4 quarts = 8 pints = 3.785 liters.
1 pint = 473.16 ml.

Units of Weight

Grains			Grams	Apothecaries* Ounces	Avoirdupois Pounds	Kilograms
1 gr.	=	1.0	0.0648	0.00208	0.0001429	0.000065
1 gm.	=	15.432	1.0	0.03215	0.002205	0.001
1 ℥	=	480.0	31.1	1.0	0.06855	0.0311
1 lb.	=	7000.0	453.5924	14.583	1.0	0.45354
1 kg.	=	15432.358	1000.0	32.15	2.2046	1.0

1γ = 1 gamma = 1 microgram = 0.001 milligram; 1000γ = 1 mg.
1 mg. = 1 milligram = 0.001 gm.; 1000 mg. = 1 gm.
1 grain = 64.8 mg.; 1 mg. = 0.0154 grain.

Metric-Customary Equivalents Chart

1 inch = 0.39 inch
1 foot = 3.28 feet
1 yard = 1.09 yards
1 mile = 0.62 mile
1 sq in = 0.16 sq in
1 sq ft = 10.8 sq ft
1 sq yd = 1.2 sq yd
1 acre = 2.5 acres
1 cu in = 0.06 cu in
1 cu ft = 35.3 cu ft
1 cu yd = 1.3 cu yd

1 cm = 2.54 cm
1 m = 0.305 m
1 m = 0.91 m
1 km = 1.61 km
1 cm^2 = 6.5 cm^2
1 m^2 = 0.09 m^2
1 m^2 = 0.8 m^2
1 hectare = 0.4 hectare
1 cm^3 = 16.4 cm^3
1 m^3 = 0.03 m^3
1 m^3 = 0.8 m^3

1 ml = 0.2 tsp
1 ml = 0.07 tbsp
1 l = 33.8 fl oz
1 l = 4.2 cups
1 l = 2.1 pts
1 l = 1.06 qt
1 l = 0.26 gal
1 gram = 0.035 oz
1 kg = 2.2 lb
1 metric ton = 2205 lb
1 kPa = 0.145 psi

1 tsp = 5 ml
1 tbsp = 15 ml
1 fl oz = 29.6 ml
1 cup = 237 ml
1 pt = 0.47 l
1 qt = 0.95 l
1 gal = 3.79 l
1 oz = 28.3 g
1 lb = 0.45 kg
1 ton = 907.2 kg
1 psi = 6.895 kPa

Millilitres to Fluid Ounces (Approximate)

ml	fl.oz	ml	fl.oz.	ml	fl.oz.
100	3.4	10	.3	1	.03
200	6.8	20	.7	2	.07
300	10.1	30	1.0	3	.10
400	13.5	40	1.4	4	.14
500	16.9	50	1.7	5	.17
600	20.3	60	2.0	6	.20
700	23.7	70	2.4	7	.24
800	27.1	80	2.7	8	.27
900	30.4	90	3.0	9	.30

5 ml (4.9 ml) = 1 teaspoon
15 ml (14.8 ml) = 1 tablespoon

Fluid Ounces to Millilitres (Approximate)

fl.oz.	ml	fl.oz.	ml	fl.oz.	ml
10	295.7	1	29.6	.1	3
20	591.5	2	59.2	.2	6
30	878.2	3	88.7	.3	9
40	1182.9	4	118.3	.4	12
50	1478.7	5	147.9	.5	15
60	1774.4	6	177.4	.6	18
70	2070.2	7	207.0	.7	21
80	2365.9	8	236.6	.8	24
90	2661.6	9	266.2	.9	27

1 teaspoon = 5 ml (4.9 ml)
1 tablespoon = 15 ml (14.8 ml)

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #1--PREFIXES, SYMBOLS, AND VALUES

Directions: Complete the table below by placing the correct prefixes, symbols, and values in the proper place.

UNIT	SYMBOL	EQUIVALENT IN METERS
1. kilometer		
2. hectometer		
3. dekameter		
4. meter		
5. decimeter		
6. centimeter		
7. millimeter		

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #2--LENGTH

Directions: From the following list decide what metric unit of length you would use when measuring.

1. The meter replaces the customary foot and yard. The meter is usually used for expressing dimensions of larger objects and short distances.

2. The kilometer replaces the mile and is used for measuring long distances.

3. The centimeter often replaces the foot and inch when used for measuring such items as body dimensions, cloth products (e.g., towels and sheets), and many other common household articles.

4. The millimeter replaces the inch and is used when measuring small dimensions or very short lengths. It is used instead of the centimeter for precision measurements.

EXERCISE

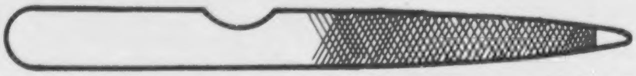
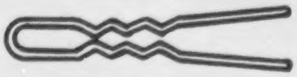
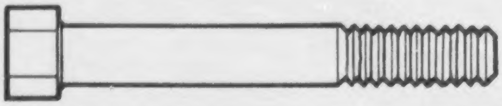
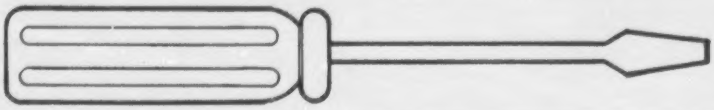
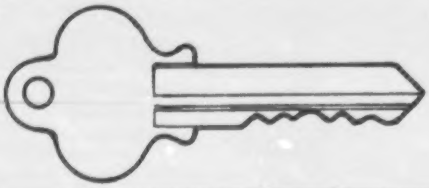
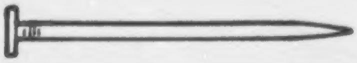
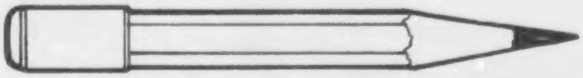
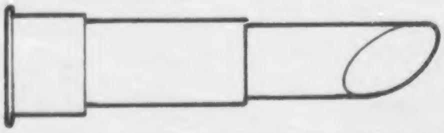
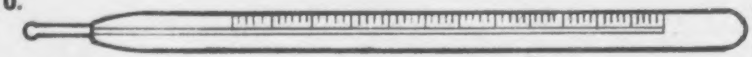
1. the length of a swimming pool __________ 1.
2. the length of a pencil __________ 2.
3. the distance between cities __________ 3.
4. the thickness of a piece of plate glass __________ 4.
5. the width of a swimming pool __________ 5.
6. the height of a building __________ 6.
7. the height of a person __________ 7.
8. the diameter of a small piece of copper tubing __________ 8.
9. the width of a tablecloth __________ 9.
10. the diameter of a nickel __________ 10.

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #3--RECORD THE ACTUAL LENGTH

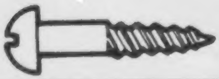
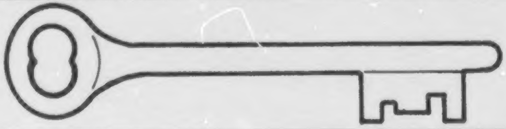
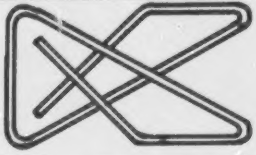
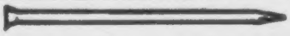
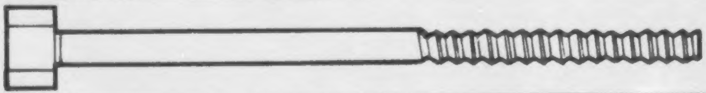
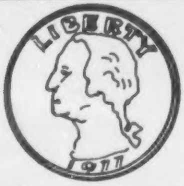
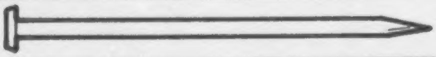
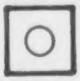
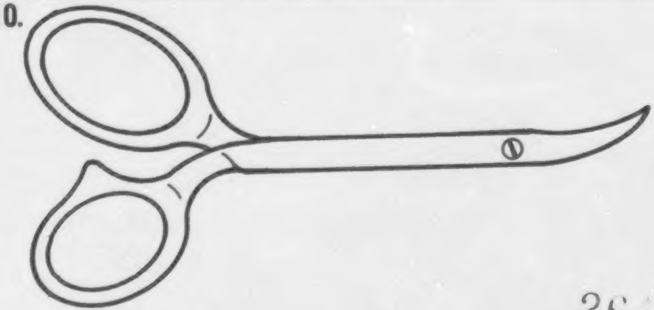
Directions: Compare the actual measurement with your estimate to see how well you estimated the length of each object. The actual measurement for the first item is given. This should aid you in estimating the length of the other objects.

	Estimate in Centimeters	**Actual Measurement**
1.		5 cm.
2. 		
3. 		
4. 		
5. 		
6. 		
7. 		
8. 		
9. 		
10. 		

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #4--ESTIMATING AND MEASURING THE LENGTH OF ITEMS IN MILLIMETERS

Directions: Estimate the length of each object. Compare your estimate with the actual length in millimeters. The actual length of the first item is given.

	Estimate in Millimeters	Actual Measurement
1. 		30 mm.
2. 		
3. 		
4. 		
5. 		
6.		
7. 		
8. 		
9. 		
10. 		

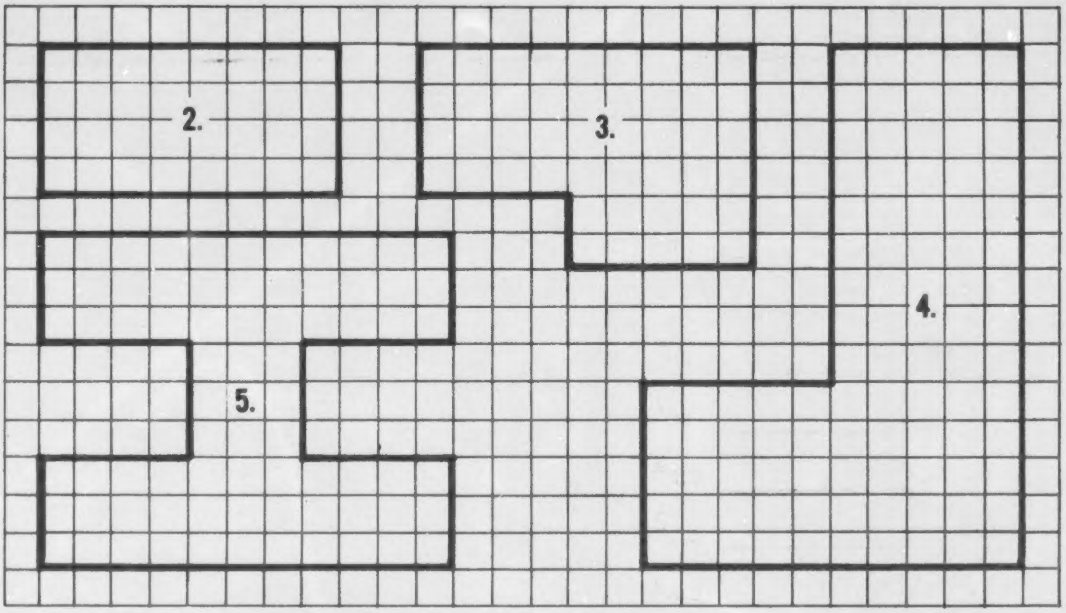
UNIT XVII

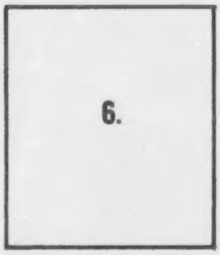
METRICS FOR HEALTH OCCUPATIONS

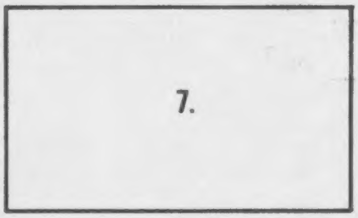
ASSIGNMENT SHEET #5--FINDING THE AREA OF A RECTANGLE

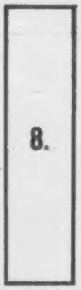
Directions: Each small square in the illustration represents one square centimeter. Determine the area of the large rectangle. Then find the area of each of the four smaller figures with in the rectangle.

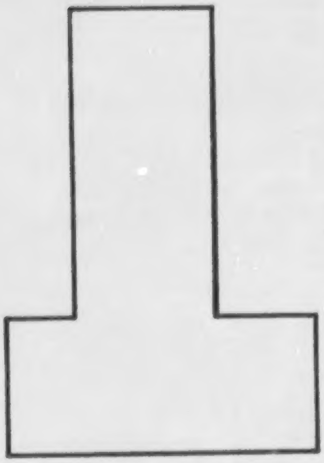
1.

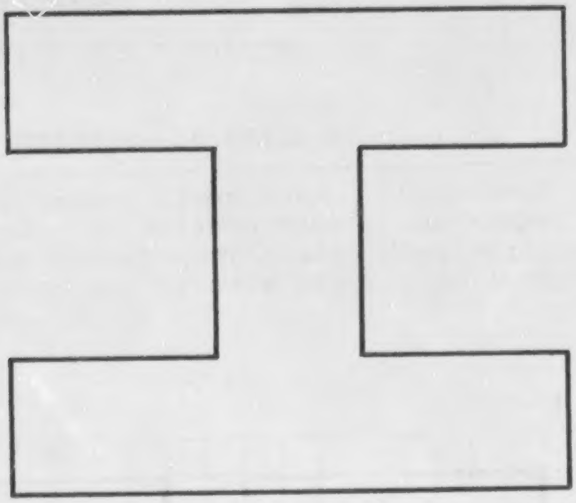












1. ______________ cm^2
2. ______________ cm^2
3. ______________ cm^2
4. ______________ cm^2
5. ______________ cm^2
6. ______________ cm^2
7. ______________ cm^2
8. ______________ cm^2
9. ______________ cm^2
10. ______________ cm^2

UNIT XVII

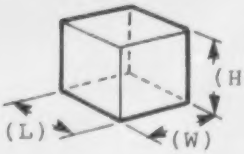
METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #6--IDENTIFYING VOLUME AND CAPACITY IN CENTIMETERS AND MILLIMETERS

Directions: Use your metric ruler to determine the length, width, and height of the figures below, along the edges indicated. Then determine the volume of each.

1. (L)____mm

2. (H)____mm

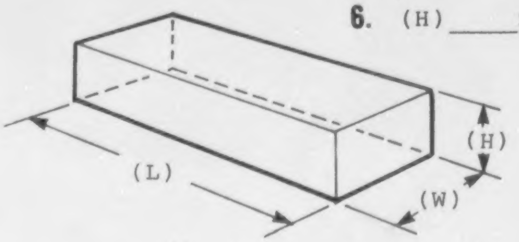


3. (W)____mm

4. Total____mm^3

5. (L)____mm

6. (H)____mm

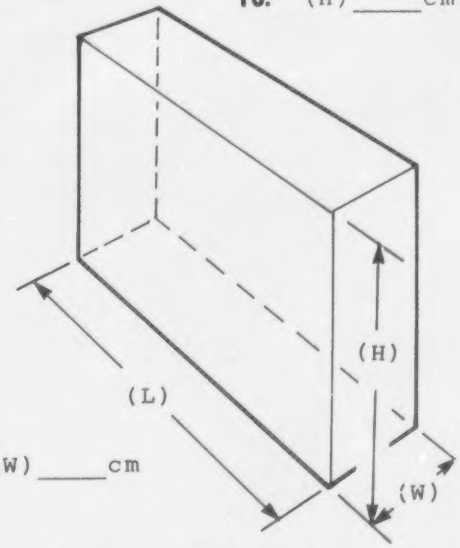


7. (W)____mm

8. Total____mm^3

9. (L)____cm

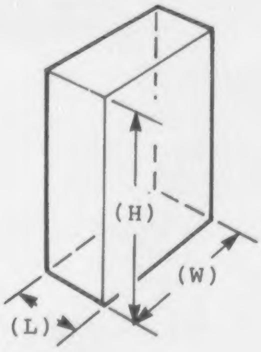
10. (H)____cm



11. (W)____cm

12. Total____cm^3

13. (L)____cm



14. (H)____cm

15. (W)____cm

16. Total____cm^3

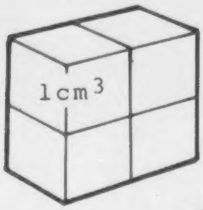
UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

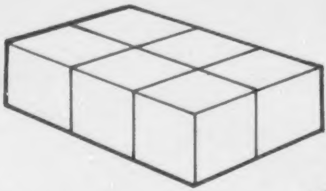
ASSIGNMENT SHEET #7--IDENTIFYING VOLUME AND CAPACITY IN CUBIC CENTIMETERS

Directions: Using a metric ruler, determine the volume of each of the figures below:

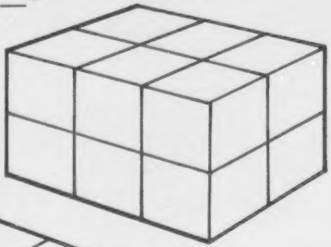
1. ____cm^3

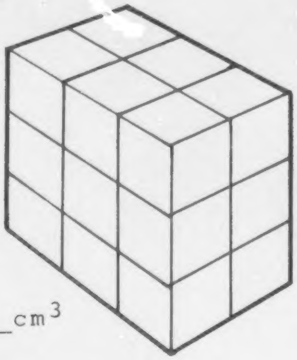


2. ____cm^3

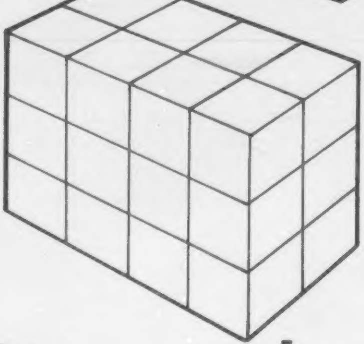


3. ____cm^3



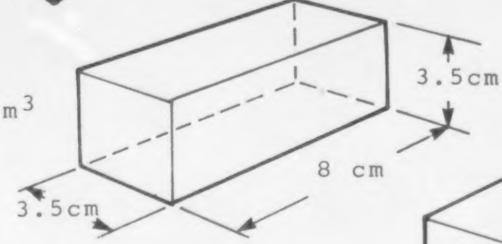


4. ____cm^3

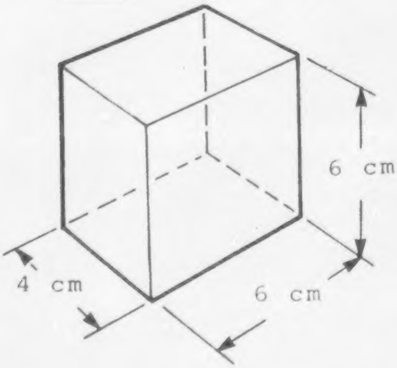


5. ____cm^3

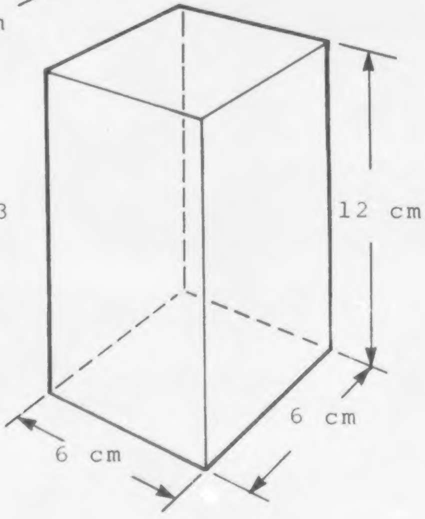
6. ____cm^3


3.5cm
8 cm
3.5cm

7. ____cm^3



8. ____cm^3


12 cm
6 cm
6 cm

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #8--DETERMINING UNITS OF MASS IN MEASURING PARTICULAR ARTICLES

Directions: When expressing weight, the most commonly used metric measures are the kilogram, gram, milligram, and metric ton. The kilogram is equal to 2.2 pounds and usually replaces the pound when used to express weight for items of more than 2 pounds. The gram is used much more often and is used in place of the ounce. Most consumer goods now sold by the pound will be sold in quantities of 500 grams, or half a kilogram. The milligram is used quite extensively in the medical and scientific fields as well as in the drug industry. Practically all bottles of tablets are now listed in either milligrams, or grams. The metric ton replaces the customary ton and is used to indicate items of great weight. These two should not be confused. The customary ton is equal to only 907.18 kilograms, while the metric ton is equal to 1000 kilograms. What metric unit of mass would probably be used to measure the following?

1. Box of detergent ______________________________
2. Loaf of bread ________________________________
3. Large beef roast ______________________________
4. A person's weight _____________________________
5. Small box of rice _____________________________
6. Weight of a load of coal _______________________
7. Small box of matches __________________________
8. One aspirin tablet _____________________________

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #9--DETERMINING MASS AND WEIGHT

Directions: Use the table of equivalent measures to determine the following:

EQUIVALENT MEASURES

1 cubic decimeter = 1 liter (l)

1 liter (l) = 1 kilogram (kg)

1 cubic centimeter (cm^3) = 1 milliliter (ml)

1 milliliter (ml) = 1 gram (g)

1. One liter of water equals ____________ dm^3.
2. One liter of water weighs ____________ kg.
3. Five kilograms equals ______________ l.
4. One liter of water equals ____________ cm^3.
5. One liter of water weighs ____________ g.
6. 25 milliliters of water equal _________ cm^3.
7. 25 milliliters of water weighs _________ g.
8. 60 cubic centimeters equals ___________ ml.
9. 60 cubic centimeters weighs ___________ g.

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #10--CONVERTING TEMPERATURES--BOTH CELSIUS AND FAHRENHEIT

Directions: Using the necessary formula below, convert the following temperatures.

From Celsius to Fahrenheit

$$F = \frac{9}{5}C + 32$$

From Fahrenheit to Celsius

$$C = \frac{5}{9}(F - 32)$$

Convert 20°C to F.

$F = \frac{9}{5}C + 32$

$F = \frac{9}{5}(20) + 32$

$F = 36 + 32$

$F = 68^\circ$

Convert 95°F to C.

$C = \frac{5}{9}(F - 32)$

$C = \frac{5}{9}(95 - 32)$

$C = \frac{5}{9}(63)$

$C = 35^\circ$

Occasionally it is necessary to use minus temperatures (negative numbers) when converting from one system to another. When this is done you must be sure to use the rules for signed numbers.

Convert -5°C to F

$F = \frac{9}{5}C + 32$

$F = \frac{9}{5}(-5) + 32$

$F = -9 + 32$

$F = 23^\circ$

Convert 14°F to C

$C = \frac{5}{9}(F - 32)$

$C = \frac{5}{9}(14 - 32)$

$C = \frac{5}{9}(-18)$

$C = -10^\circ$

Convert -4°F to C

$C = \frac{5}{9}(F - 32)$

$C = \frac{5}{9}(-4 - 32)$

$C = \frac{5}{9}(-36)$

$C = -20^\circ$

1. 25°C = ____________°F
2. 10°C = ____________°F
3. 90°C = ____________°F
4. 150°C = ____________°F
5. 50°F = ____________°C
6. -22°F = ____________°C
7. 275°F = ____________°C
8. 5°F = ____________°C
9. 320°F = ____________°C
10. -20°C = ____________°F

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #11--CONVERTING YARDS, MILES, AND POUNDS

Directions: Convert the following, using Information Sheet VII as a guide. Show your work when asked.

A. 65 meters = _______ yards

B. 12.4 meters = _______ yards

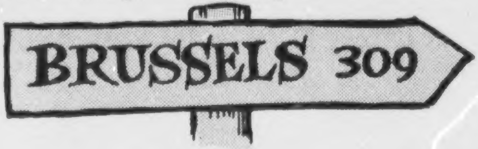
C. 2500 meters = _______ yards

D. 1 km = ________ yards

E. Garland and Commerce, Texas are about 100 kilometers apart. How many miles apart are they? _____________

F. Dallas and Conroe, Texas are about 5500 kilometers apart. Approximately how many miles is that? _________ Show work.

G. If you are traveling in Europe, and see a road sign saying:



approximately how many miles is it to Brussels? _______

H. A speed of 65 km per hour would be equal to approximately ______________ miles per hour?

I. How many miles are there in 11,000 meters? ____________ Show work.

J. 10 kg = __________ lbs. Show work.

K. 45 kg = __________ lbs. Show work.

L. 100 kg = __________ lbs. Show work.

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #12--COMPARISON OF THE METRIC SYSTEM TO ENGLISH SYSTEM

Directions: The student will complete the statement by placing the signs (<) for less than and (>) for more than to make the statement true.

1. A centimeter is ( ) than half an inch
2. An m is a little ( ) than a yard.
3. A l is a little ( ) than a quart.
4. A kg is a little ( ) than 2 lbs.
5. A km is a little ( ) than a mile.

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #13--CONVERTING A VALUE IN ONE SYSTEM TO THE CORRESPONDING VALUE IN THE OTHER

Directions: Use TM-4 to acquire necessary data in solving the following problems. Use either method you desire.

1. 3 gal = _____ pt.
2. 1 mil = _____ km
3. 4 oz = ______ g
4. 2 gal = ______ l
5. 3 m^3 = _____ in^3

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #14--CONVERTING THE METRIC EQUIVALENTS

Directions: Complete the chart below.

Meter m	Centimeter cm	Millimeter mm
1	100	1 000
2	200	
3		
9		
		5 000
74		
0.8	80	
0.6		600
	2.5	25
		148
	639	

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #15--CONVERTING MILLILITERS TO LITERS

Directions: Place the missing figure in the chart below.

Milliliters (ml)	Liters (l)
3000	3
6000	
	8
14,000	
	23
300	0.3
700	
	0.9
250	
	0.47
275	

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #16--CONVERTING LITERS TO MILLILITERS

Directions: Complete the following chart.

Liters 1	Milliliters ml
8	8 000
5	
46	
	32 000
0.4	
0.53	
	480

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #17--CONVERTING GRAMS TO KILOGRAMS

Directions: Complete the following chart.

Grams g	Kilograms kg
4 000	4
9 000	
23 000	
	8
300	
275	

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #18--CONVERTING KILOGRAMS TO GRAMS

Directions: Complete the following chart.

Kilograms kg	Grams g
7	7 000
11	
	25 000
0.4	
0.63	
	175

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #19--CHANGING UNITS AT WORK

Directions: The things listed below are used in Health Occupations. They may be measured in different metric units. Change each of the following to metric equivalents by completing these statements.

1. 500 cm of sterile gauze is _____________ m.
2. 1250 ml of liquid is ______________ l.
3. 5 cm wide bed protector is _______________ mm.
4. 2500 g child weighs ______________ kg.
5. 120 mm of sheet from head of bed is _________ cm.
6. 0.25 liter of milk is ___________ ml.
7. 0.5 liter of glucose solution is ____________ ml.
8. 1.5 m of body height is ___________ cm.
9. 5 g of orthopedic weight is __________ mg.
10. 500 mg of infant formula is ____________ g.
11. 500 g of a specimen is ____________ kg.
12. 500 ml of concentrate is ___________ l.
13. 100 mg of emesis is ________ g.
14. 60 cm of bandage is __________ m.

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #20--METRIC GRID

Directions: The grid below contains the words needed to complete the statements found on the next page. Words may run across or down and sometimes may overlap. Write the words as you find them on the grid.

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	F	R	T	S	S	C	M	D	D	E	C	I	M	A	L
2	C	H	L	I	T	E	R	P	E	L	E	V	E	N	S
3	I	J	O	E	F	O	O	T	O	A	N	B	S	M	T
4	N	O	F	B	G	I	E	F	I	F	T	E	E	N	H
5	C	U	B	I	C	K	K	E	L	V	I	N	M	N	I
6	H	N	K	H	C	I	O	S	A	M	P	E	R	E	R
7	T	C	X	J	U	L	H	E	A	A	K	Y	T	H	T
8	C	E	S	U	P	O	U	N	D	S	I	R	E	D	Y
9	W	W	E	T	O	G	F	C	S	S	L	Y	A	R	D
10	D	E	K	A	S	R	L	O	V	M	O	J	S	V	S
11	R	I	G	S	S	A	V	N	O	S	M	S	P	W	E
12	G	G	L	N	O	M	F	D	L	E	E	T	O	N	C
13	R	H	Y	A	D	E	C	I	U	R	T	N	O	D	O
14	A	T	H	R	E	E	C	C	M	U	E	K	N	I	N
15	M	H	H	E	C	T	A	R	E	G	R	E	E	K	D

Statements

1. The _____________ is slightly larger than 1 quart.
2. Three dimensions are needed to find ____________.
3. The _____________ number system is used in metrics.
4. The symbol for kilogram is ____________.
5. The metric prefix for one-hundredth is ___________.
6. The _____________ is shorter than one meter.
7. The _____________ is a little longer than 0.6 miles.
8. The mass of 1 cubic decimeter of water is __________.
9. A bathroom scale measures ______________.
10. The metric prefix for 10 is ___________.
11. Another name for the metric system is abbreviated as ___________.
12. The abbreviation for centimeter is ______________.
13. 453.5924 grams is equal to one ____________.

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #21--ANY WAY YOU WANT IT

Directions: You are working in a hospital, clinic, doctor's office, or a laboratory. With the change to metric measures, some of the things you order or use are worded only in metric units. You will need to be familiar with appropriate customary equivalents in order to communicate with patients and suppliers who use customary unit. To develop your skills use TM-5 as reference and give the approximate metric quantity (both number and unit) for each of the following customary quantities.

Customary Quantity	Metric Quantity
1. 2 lbs. of orthopedic weight	
2. 4 qts. of clear solution	
3. 2 in. x 12 in. adhesive tape	
4. 100 lb. person	
5. 18 in. water column	
6. 2-gallon can	
7. 2-foot bandage	
8. 1 in. adhesive tape	
9. 50 ft. of orthopedic tape	
10. 4 fl. oz. of mouthwash	
11. 12 in. by 12 in. bed protector	
12. 1 gal. of alcohol	
13. 1 pt. of milk	
14. 2 qts. of sterilizing solution	
15. 1 tbsp. gelatin	
16. 6 fl. oz. glass of juice	

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #22--WHICH TOOL FOR THE JOB

Directions: Select and describe use of tools, instruments, or devices to:

1. Take and record urine specimen
2. Prepare a clear solution
3. Compute, measure, and record I and O for a patient
4. Prepare a bath
5. Take and record oral temperature
6. Select the proper measure for a soup bowl
7. Take and record axillary temperature
8. Select the proper size of an ace bandage for a foot
9. Select the proper size roller dressing for a finger

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #23--CONVERTING METRIC MEASUREMENT TO CUSTOMARY UNITS

Directions: Use TM-5 as a reference in completing the assignment.

1. 235 ml = __________ fl. oz.
2. 950 ml = __________ fl. oz.
3. 16 fl. oz. = _________ ml
4. 3.5 fl. oz. = ________ ml
5. 550 ml = ___________ fl. oz.

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ASSIGNMENT SHEET #24--COMPLETE A REQUISITION FORM

Directions: Using the items listed, convert the customary quantities to metric before filling out the form. Complete all the information (date, for, doctor, etc.) Use TM-5 as reference.

1. 1 pint of mouthwash
2. 1 quart of alcohol
3. 12 foot traction rope
4. 1 package of 12-inch by 12-inch bed protector

REQUISITION

Date

For

Dept.

Doctor

Deliver to

Qty	Unit	Item

Requested by

Approved by

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

	SYMBOL	EQUIVALENT IN METERS
1.	km	1000
2.	hm	100
3.	dam	10
4.	m	----
5.	dm	0.1
6.	cm	0.01
7.	mm	0.001

Assignment Sheet #2

1. meters
2. centimeters
3. kilometer
4. millimeters
5. meters
6. meters
7. centimeters
8. millimeters
9. centimeters
10. millimeters

Assignment Sheet #3

1. 5 cm
2. 9 cm
3. 4 cm
4. 7 cm
5. 10 cm
6. 6 cm
7. 5 cm
8. 8 cm
9. 6 cm
10. 11 cm

Assignment Sheet #4

1. 30 mm
2. 70 mm
3. 35 mm
4. 40 mm
5. 100 mm
6. 50 mm
7. 24 mm
8. 60 mm
9. 10 mm
10. 90 mm

Assignment Sheet #5

1. 448 cm^2
2. 32 cm^2
3. 46 cm^2
4. 95 cm^2

5. 75 cm^2
6. 10.5 cm^2
7. 15 cm^2
8. 4 cm^2
9. 18 cm^2
10. 38 cm^2

Assignment Sheet #6

1. 10 mm
2. 10 mm
3. 10 mm
4. 1000 mm
5. 40 mm
6. 10 mm
7. 15 mm
8. 6000 mm^3
9. 5 cm
10. 10 cm
11. 1.5 cm
12. 30 cm
13. 1 cm
14. 3 cm
15. 2 cm
16. 6 cm^3

Assignment Sheet #7

1. 4 cm^3
2. 6 cm^3
3. 12 cm^3

4. 18 cm^3
5. 24 cm^3
6. 98 cm^3
7. 144 cm^3
8. 432 cm^2

Assignment Sheet #8

1. grams
2. grams
3. kilograms
4. kilograms
5. grams
6. metric ton
7. grams
8. milligrams

Assignment Sheet #9

1. 1 dm^3
2. 1 kg
3. 5 l
4. 1000 cm^3
5. 1000 g
6. 25 cm^3
7. 25 g
8. 60 ml
9. 60 g

Assignment Sheet #10

1. 77°F
2. 50°F

3. 194°F

4. 302°F

5. 10°C

6. -30°C

7. 135°C

8. 15°C

9. 160°C

10. -4°F

Assignment Sheet #11

A. 73.5

B. 136.4

C. 3750.0

D. 1100.0

E. 60 miles

F. 330 = (550 x .6 = 330)

G. 185.4 (309 x .6 = 185.4)

H. 30 miles per hour

I. 6.6 miles   11000 m = 11 km   11 x .6 = 6.6

J. 10 x 2.2 = 22.0

K. 45 x 2.2 = 99.0

L. 100 x 2.2 = 220.0

Assignment Sheet #12

1. < less than

2. > greater than

3. > greater than

4. > greater than

5. < less than

Assignment Sheet #13

1. 3 gal = 24 pt.

$3\ \text{g}\cancel{\text{a}}\text{l} \times \frac{4\ \cancel{\text{q}}\text{t}}{1\ \text{g}\cancel{\text{a}}\text{l}} \times \frac{2\ \text{pt}}{1\ \text{q}\cancel{\text{t}}} = \frac{24\ \text{pt}}{1} = 24\ \text{pt.}$

2. 1 mi = 1.61 km

$1\ \text{mi} \times \frac{5280\ \text{f}\cancel{\text{t}}}{1\ \text{m}\cancel{\text{i}}} \times \frac{12\ \text{i}\cancel{\text{n}}}{1\ \text{f}\cancel{\text{t}}} \times \frac{25.4\ \text{m}\cancel{\text{m}}}{1\ \text{i}\cancel{\text{n}}} \times \frac{1\ \cancel{\text{m}}}{1000\ \text{mm}} \times \frac{1\ \text{k}\cancel{\text{m}}}{1000\ \cancel{\text{m}}} =$

$\frac{1609344\ \text{km}}{1000000} = 1.609344 = 1.61$ (rounded off)

3. 4 oz = 114 g

$4\ \text{o}\cancel{\text{z}} \times \frac{1\ \text{l}\cancel{\text{b}}}{16\ \text{o}\cancel{\text{z}}} \times \frac{1\ \text{k}\cancel{\text{g}}}{2.20\ \text{l}\cancel{\text{b}}} \times \frac{1000\ \text{g}}{1\ \text{k}\cancel{\text{g}}} = \frac{4000\ \text{g}}{35.2} = 133.6363$

rounded off to 114 g

4. 2 gal = 7.55 l

$2\ \text{g}\cancel{\text{a}}\text{l} \times \frac{4\ \text{q}\cancel{\text{t}}}{1\ \text{g}\cancel{\text{a}}\text{l}} \times \frac{1\ \text{l}}{1.06\ \text{q}\cancel{\text{t}}} = \frac{8\ \text{l}}{1.06} = 7.5471698\ \text{l} =$

rounded off to 7.55 l

5. $3\ \text{m}^3$ = 183000 in^3

$3\ \cancel{\text{m}}^3 \times \frac{(1000\ \text{mm})^3}{1\ \cancel{\text{m}}^3} \times \frac{1\ \text{in}^3}{(25.4\ \text{mm})^3} = \frac{30000000\ \text{in}^3}{16387.065} =$

$\frac{30000000}{16387.064} = 18307123$ rounded to $= 183000\ \text{in}^3$

Assignment Sheet #14

Meter	Centimeter	Millimeters
1	100	1000
2	200	2000
3	300	3000
9	900	9000
5	500	5000
74	7400	74000
0.8	80	800
0.6	60	600
0.025	2.5	25
0.148	14.8	148
6.39	639	6390

Assignment Sheet #15

Milliliters	Liters
3000	3
6000	6
8000	8
14000	14
23000	23
300	0.3
700	0.7
900	0.9
250	0.25
470	0.47
275	0.275

Assignment Sheet #16

Liters l	Milliliters ml
8	8000
5	5000
46	46000
32	32000
0.4	400
0.53	530
0.48	480

Assignment Sheet #17

Grams g	Kilograms kg
400	4
900	9
2300	23
8000	8
300	0.3
275	0.275

Assignment Sheet #18

Kilograms kg	Grams g
7	7000
11	11000
25	25000
0.4	400
0.63	630
0.175	175

Assignment Sheet #19

1. 5m
2. 1.250 liter
3. 50 mm
4. 2.5kg
5. 12cm
6. 250ml
7. 500ml
8. 150cm
9. 5000mg

10. 0.5g
11. 0.5kg
12. 0.5 l
13. 0.1g
14. 0.6m

Assignment Sheet #20

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	F	R	T	S	S	C	M	D	D	E	C	I	M	A	L
2	C	H	L	I	T	E	R	P	E	L	E	V	E	N	S
3	I	J	O	E	F	O	O	T	O	A	N	B	S	M	T
4	N	O	F	B	G	I	E	F	I	F	T	E	E	N	H
5	C	U	B	I	C	K	K	E	L	V	I	N	M	N	I
6	H	N	K	H	C	I	O	S	A	M	P	E	R	E	R
7	T	C	X	J	U	L	H	E	A	A	K	Y	T	H	T
8	C	E	S	U	P	O	U	N	D	S	I	R	E	D	Y
9	W	W	E	T	O	G	F	C	S	S	L	Y	A	R	D
10	D	E	K	A	S	R	L	O	V	J	O	Y	S	V	S
11	R	I	G	S	S	A	V	N	O	S	M	S	P	W	E
12	G	G	L	N	O	M	F	D	L	E	E	T	O	N	C
13	R	H	Y	A	D	E	C	I	U	R	T	N	O	D	O
14	A	T	H	R	E	E	C	C	M	U	E	K	N	I	N
15	M	H	H	E	C	T	A	R	E	G	R	E	E	K	D

ANSWERS

1. liter
2. volume
3. decimal
4. kg
5. centi
6. yard
7. kilometer
8. 1 kilogram
9. weight
10. deka
11. SI
12. cm
13. pound

Assignment Sheet #21

1. 0.9 kg
2. 3.8 l
3. 5.08 cm x 30.48 cm
4. 45 kg
5. 45.72 cm
6. 7.58 l
7. 0.61 m
8. 2.54 cm
9. 15.25 m
10. 118.4 ml
11. 30.48 cm by 30.48 cm
12. 3.79 l
13. 0.47 l
14. 1.9 l
15. 15 ml
16. 177.6 ml

Assignment Sheet #22

Answers depend on the items used for the activities. Activities will be evaluated to the satisfaction of the instructor.

Assignment Sheet #23

1. 7.97 fl. oz.
2. 32.1 fl. oz.
3. 437.1 ml
4. 103.7 ml
5. 18.6 fl. oz.

Assignment Sheet #24

1. 0.47 l
2. 0.95 l
3. 3.66 mm
4. 30.48 cm by 30.48 cm

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

UNIT TEST

1. Name four important dates concerning the history of the metric system.

   a.

   b.

   c.

   d.

2. List seven disadvantages of using the metric system.

   a.

   b.

   c.

   d.

   e.

   f.

   g.

3. Define the following metric prefixes and root words.

   a. Kilo--

   b. Hecto--

   c. Deca--

   d. Deci--

   e. Centi--

   f. Milli--

4. Write the symbols for the following words.

   a. Millimeter _____
   b. Centimeter _____
   c. Meter _____
   d. Kilometer _____
   e. Square centimeter _____
   f. Square meter _____
   g. Hectare _____
   h. Milliliter _____
   i. Liter _____
   j. Centimeter cubed _____
   k. Cubic meter _____
   l. Milligram _____
   m. Gram _____
   n. Kilogram _____
   o. Metric ton _____

5. Answer the rules of notation by writing True or False before the sentences.

   ______a. Symbols are never to be capitalized.

   ______b. Symbols are not followed by periods.

   ______c. Symbols are not followed by an s for plurals.

   ______d. A space separates the numerals from the unit symbols.

   ______e. Spaces, not commas, are used to separate large number into groups of three digits.

   ______f. A zero precedes the decimal point if the number is greater than one.

   ______g. Liter and meter can be spelled either with an -re or -er ending.

   ______h. If dual dimensions are used, show the nonmetric unit in parentheses.

   ______i. Common use values should be rounded off rather than quoted in precise figures unless there is a definite need for exact measurement.

   ______j. Use the correct capital and lower case letters for units and multiple unit symbols.

6. Name the five types of metric measurement and the metric units of each measurement.

   a.

      (1)

      (2)

      (3)

      (4)

      (5)

      (6)

   b.

      (1)

      (2)

(3)

(4)

d.

(1)

(2)

(3)

(4)

(5)

(6)

(7)

e.

(1)

(2)

(a) ______ Freezing point of water ______

(b) ______ A warm winter day ______

(c) ______ A mild spring day ______

(d) ______ A warm summer day ______

(e) ______ Body temperature ______

(f) ______ Boiling point of water ______

7. Complete the statement of facts in conversion of metric measurement to English measure.

   a. To change metric into yards, multiply the number of meters by ___________.

   b. To change from kilometers to miles, multiply the number of kilometers by ________________.

   c. To change kilograms to pounds, multiply the number of kilograms by _____________.

8. Interpret the conversion chart by working the following problems. See (TM-4). Use the factor label method.

   a. 4m = ______cm

   b. 3.5kg = ______oz.

   c. 4 yd^2 = ______cm^2

   d. 3 gal. = ______pt.

   e. 2 gal. = ______l

9. Complete the chart on metric units for Health Occupations.

Quantity	Unit	Symbol	Use
1. Linear dimensions	centimeter		Orthopedic ropes, anatomical part, height/length of patient
		mm	Anatomical measurement, linens for bed protection
2. Surface dimensions		cm^2	
3. Fluid flows	milliliters per minute		Article decontamination, foley drainage collection
4. Mass	gram		Body mass, food portions
		kg	
5. Volume and capacity	cubic centimeter		I and O measurements, bodily secretions, dietary containers
		ml	
	liter		I and O measurement
6. Temperature		°C	

10. Complete the problems, using metric equivalents.

    a. 8 m = ______cn

    b. 6 m = ______mm

    c. 500 ml = ______l

    d. 0.65 l = ______ml

    e. 1000 g = ______kg

    f. o.25 kg = ______g

11. Measurement tasks in Health Occupation. Underline the correct measurement.

    a. Patient bodily secretions are measured in:

        (1) cubic centimeters

        (2) millimeters

        (3) kilograms

        (4) degrees Celsius

    b. The mass of an alluet body is measured in:

        (1) cubic centimeters

        (2) centimeters

        (3) milliliters

        (4) kilograms

    c. A roller bandage 200 centimeters long also has a length of:

        (1) 2,000 millimeters

        (2) 0.2 millimeters

        (3) 200 millimeters

        (4) 2 millimeters

    d. A 750 gram box of detergent is the same as:

        (1) 750 kilograms

        (2) 7,500 kilograms

(3) 7.5 kilograms

(4) 0.75 kilograms

e. The metric unit which replaces the gallon is:

(1) liter

(2) kiloliter

(3) gram

(4) kilogram

f. The metric unit which replaces the teaspoon or tablespoon for medicine dosage is:

(1) grams

(2) milliliters

(3) milligrams

(4) centimeters

g. For measuring Celsius you would use a:

(1) pressure gage

(2) thermometer

(3) container

(4) tape

12. List three steps used in finding equivalents between systems.

a.

b.

c.

13. Complete a variety of exercises using the metric system. (Assignment Sheets #1-#24)

UNIT XVII

METRICS FOR HEALTH OCCUPATIONS

ANSWERS TO UNIT TEST

1. The five important dates are:

   a. 1690--the year it was proposed

   b. 1790--the year France requested the metric system

   c. 1840--the year France officially adopted the metric system

   d. 1866--an act of Congress legalized the metric system as a secondary system of weights and measurements in the United States.

   d. 1960--the international d' units conference adopted the abbreviation (SI). The metric system is sometimes referred to as the international system.

2. The advantages should include:

   a. The metric system is used by most nations in the world and is becoming the universal language of measurement.

   b. The metric system is simple and the units are logically related to immutable standards.

   c. The metric system eliminates confusion concerning mass, force, and weight.

   d. The metric system is easy to use.

   e. Conversion to metric system would stimulate the economy.

   f. Speaking a common language of measurement could improve communication among the world's people.

   g. Computations using the metric units are convenient to use in health related occupations.

   h. The metric system is decimally constructed, conforming to our monetary system.

   i. Exports would increase to those countries using the metric system.

  j. The United States may be competitively disadvantaged because most great industrial countries use the metric system.

3. Prefixes and root words should include:

   a. Kilo--thousand--a kilo is one thousand (10^3) meters

   b. Hecto--hundred--a hecto is one hundred (10^2) meters

   c. Deca--ten--a decameter is ten (10^1) meters

   d. Deci--a word element which means one-tenth ($0.1=10^{-1}$) of a meter

   e. Centi--a word element which means one-hundredth ($0.01=10^{-2}$) of a meter

   f. Milli--a word element which means one-thousandth ($0.001=10^{-3}$) of a meter

4. Basic metric symbols

   a. mm--millimeter

   b. cm--centimeter

   c. m--meter

   d. km--kilometer

   e. cm^2--square centimeter

   f. m^2--square meter

   g. ha--hectare

   h. ml--milliliter

   i. l--liter

   j. cm^3--cubic centimeter

   k. m^3--cubic meter

   l. mg--milligram

   m. g--gram

   n. kg--kilogram

   o. t--metric ton

5. a. F
   b. T
   c. T
   d. T
   e. T
   f. F
   g. T
   h. T
   i. T
   j. T

6. Five types of units and the metric measurement and the metric unit of each measurement answer should include:

   a. Length--is the base unit for measuring length and distance in the metric system.

      (1) deka (da) = 10
          1 dekameter (dam) = 10 meters

      (2) hecto (h) = 100
          1 hectometer (hm) = 100 meters

      (3) kilo = 1000
          1 kilometer (km) = 1000 meters

      (4) deci (d) = 0.1 or 1/10
          1 decimeter (dm) = 0.1 or 1/10 meter

      (5) centi (c) = 0.01 or 1/100 meter

      (6) milli (m) = 0.001 or 1/1000
          1 millimeter (mm) = 0.001 or 1/1000 meter

   b. Area--determined by finding the number of units contained within a figure or object.

(1)	square meters	m^2
(2)	square decimeters	dm^2
(3)	square centimeters	cm^2
(4)	square millimeters	mm^2

(5) square kilometers km^2

c. Volume or capacity--refers to the numbers of cubic units in a container.

(1) cubic meter m^3

(2) cubic decimeter dm^3

(3) cubic centimeter cm^3

(4) cubic millimeter mm^3

d. Mass--a measure of the amount of matter in the object.

(1) gram (g)
1 gram = 1 gram

(2) dekagram (dag)
1 dekagram = 10 grams

(3) hectogram (hg)
1 hectogram = 100 grams

(4) decigram = 0.1 or 1/10 grams

(5) centigram (cg)
1 centigram = 0.01 or 1/100 grams

(6) milligram (mg)
1 milligram = 0.001 or 1/1000 grams

(7) 1 metric ton (1) = 1000 kilograms

e. Temperature is measured on two scales:

(1) The Kelvin scale--used primarily by scientists for precision measurement of temperature.

(2) The Celsius scale--based on the Kelvin, is used as the common metric measure of temperature.

(a) 0°C Freezing point of water 32°F

(b) 10°C A warm winter day 50°F

(c) 20°C A mild spring day 68°F

(d) 30°C A warm summer day 86°F

e. 37°C Body temperature 98.6°F

f. 100°C Boiling point of water 212°F

7. a. 1.1

b. .6

c. 2.2

8. a. $4\ \cancel{m} \times \frac{100\ cm}{1\ \cancel{m}} = \frac{400\ cm}{1} = 400\ cm$

b. $3.5\ \cancel{kg} \times \frac{2.20\ lb}{1\ \cancel{kg}} \times \frac{16\ oz}{1\ \cancel{lb}} = \frac{120\ oz}{1} = 120\ g$

c. $4\ yd = \frac{(3\ \cancel{ft})^2}{1\ \cancel{yd}^2} \times \frac{(12\ \cancel{in})^2}{1\ \cancel{ft}^2} \times \frac{(2.54\ cm)^2}{1\ \cancel{in}^2} = 33445.1\ cm^2$

d. $3\ gal = \frac{4\ \cancel{qt}}{1\ \cancel{gal}} \times \frac{2\ pt}{1\ \cancel{qt}} = 24\ pt$

e. $2\ \cancel{gal} = \frac{4\ \cancel{qt}}{1\ \cancel{gal}} \times \frac{1\ \cancel{l}}{1.06\ \cancel{qt}} = 7.55\ l$

9. Chart on metric units

Quantity	Unit	Symbol	Use
1. Linear dimensions	centimeter	cm	Orthopedic ropes, anatomical part, height/length of patient
	millimeter	mm	Anatomical measurement, linens for bed protection
2. Surface dimensions	square centimeter	cm^2	Linens, disposable bed protectors
3. Fluid flows	milliliters	ml/min	Article decontamination, drainage collection
4. Mass	gram	g	Body mass, food portions
	kilogram	kg	Body mass, orthopedic weight
5. Volume and capacity	cubic centimeter	cm^3(cc.)	I and O measurements, bodily secretions, dietary containers
	milliliter	ml	I and O measurements, bodily secretions, dietary containers
	liter	l	I and O measurement
6. Temperature	degree Celsius	°C	Body temperature, baths, sterilization

10. Metric equivalents

    a. 8 m = 8 x 100 cm = 800 cm

    b. 6 m = 6 x 1000 mm = 6000 mm

    c. 500 ml = $\frac{500}{1000}$ liter = 0.5 liter (five-tenth of a liter) 500 ml is the same as one-half (0.5) of a liter.

    d. 0.65 liter = 0.65 x 1000 ml = 650 ml

    e. 1 kg

    f. 0.25 kg = o.25 x 1000 g - 250 g

11. Measuring tasks in Health Occupations

    a. 1

    b. 2

    c. 1

    d. 4

    e. 1

    f. 2

    g. 2

12. List should include:

    a. Which conversion table is needed,

    b. Look up the known number in appropriate column. If not listen, find numbers you can add together to make the total of the known number.

    c. Read the equivalent(s) from the next column.

13. Assignment sheets will be evaluated to the satisfaction of the instructor.

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

UNIT OBJECTIVE

After completing this unit, the student will be able to identify, define, and discuss terms and factors relating to human relations in Health Occupations. The students will also participate in activities that will aid them to understand themselves and to communicate with others. This knowledge will be evidenced through demonstration and by satisfactorily completing a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Match terms and definitions relating to human relations.
2. Discuss the history of human relations.
3. List and explain factors involved in self-understanding.
4. Discuss techniques for being accepted by fellow employees.
5. Identify reasons why employees lose their jobs.
6. Explain factors that affect human relations with employers.
7. Cite the basic ways of getting along with people.
8. Select from a list why people work and set goals.
9. Discuss establishing human relations with the patients.
10. Discuss human relations in communication.
11. List and discuss barriers to good communication.
12. Interview class members.
13. Rate individual self image.
14. Interview an employer.

15. Practice the development of a relationship between a patient and the attendant.
16. List multiple meanings of familiar terms.
17. List common meanings of words.
18. Write a communication problem.
19. Participate in situations using "grapevine" information.

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

SUGGESTED ACTIVITIES

I. Instructor

   A. Provide objectives sheet

   B. Discuss objectives sheet

   C. Pass out information sheet

   D. Discuss information sheet

   E. Make and show transparencies

   F. Distribute and discuss assignment sheets

   G. Invite a resource person to discuss human relations in Health Occupations

   H. Give test and evaluate

II. Student

   A. Read and discuss objectives sheet

   B. Read and discuss material contained in information sheet

   C. Complete assignment sheets

   D. Listen to resource person's discussion on human relations in Health Occupations

   E. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit

   A. Objectives sheet

   B. Information sheet

   C. Transparency master

      XVIII-TM-1--Relationships with People

D. Assignment sheets

  1. Assignment Sheet #1--Learning About Class Members
  2. Assignment Sheet #2--Rating Your Many Selves
  3. Assignment Sheet #3--Interviewing an Employer
  4. Assignment Sheet #4--Developing a Relationship With a Patient
  5. Assignment Sheet #5--Identifying Multiple Meanings
  6. Assignment Sheet #6--Finding Common Meanings of Words
  7. Assignment Sheet #7--Meanings of Communications are in People, Not in Words
  8. Assignment Sheet #8--Barriers in Communications

E. Answers to assignment sheets

F. Unit test

G. Answers to unit test

II. References

A. Books

1. Caldwell, Esther. Health Assistant. Albany, New York: Delmar Publishers, 1973.
2. Eggland, Steven A. and John W. Williams. Human Relations in Business. Dallas: South-Western Publishing Co., 1977.
3. Harvey, William V. Communication and Organizational Behavior. Homewood, Illinois: Richard D. Irwin, Inc., 1973.
4. Kimbrell, Grady and Ben S. Vineyard. Succeeding in the World of Work. Bloomington, Illinois: McKnight Publishing Co., 1975.

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

INFORMATION SHEET

I. Definition of terms

A. Assertiveness--bold or confident behavior

B. Attitude--a feeling or action concerning a particular situation

C. Bypassing--word or expression has different meanings to the speaker and to the receiver

D. Competence--the ability to perform a required task

E. Consideration--thoughtful and sympathetic regard for another individual

F. Co-workers--the people with whom you work

G. Employer--the person for whom you work

H. Fad--something a person does for a short time and then forgets

I. Flattery--the practice of insincere or excessive praise

J. Goal--an objective; what one plans to achieve

K. Honesty--qualities of truthfulness, honor and integrity; free of fraud or deception

L. Human Relations--refers to the relationship between people. These relationships can be formal or informal, close or distant, emotional or unemotional

M. Loyalty--a feeling of obligation to one's employer or job

N. Negative self-image--your belief that you are inadequate for your job

O. People knowledge--knowing how to get along with others

P. Personality--the complex of characteristics that distinguish an individual. It is the combination of personal traits that make one individual different from every other person

Q. Positive self-image--your belief that you are capable of doing your job

R. Self-image--what you think of yourself

S. Short-term goal--what one plans to achieve in a short time--a day, a week, or a month, for example

T. Technical knowledge--what you know about the job itself

U. Tolerance--the ability to cope with habits or mannerisms of other individuals

V. Tolerance level--the point at which others' habits or mannerisms begin to bother one

W. Trustworthiness--dependable, worthy of confidence

X. Values--personal beliefs about what is desirable and worthwhile

II. Industry's interest in human relations

A. Western Electric Company's experiment

1. The Western Electric Company sought ways to increase the productivity of it's employees.

2. An experiment was devised to determine if the amount of light in the working area affected productivity.

    a. First, special equipment was installed to provide better lighting

    b. Second, special equipment was installed that provided less light. Productivity remained high

    c. Finally, the lighting was returned to the original level. The high level of productivity was maintained

3. When the experimenters completed their work, they removed all the special equipment and left the work area.

4. As the employees found that the experiment was complete, their productivity returned to the lower level at which they had worked before the experiment began.

B. Conclusions from the experiment

1. The Western Electric Company concluded that their employees increased their productivity as long as they felt the owners cared about them. The installation of special equipment indicated concern.

2. Productivity decreased after the experiment because the employees felt that the owner's only interest in them was to make sure they worked.

C. Effects of experiment

1. From this study, employers realized that emphasis on workers was important for productivity.

2. This study helped to open a new era in business management,with emphasis on human relations.

III. Factors involved in self-understanding

A. Self-acceptance--to accept yourself as you are

B. Self-image--what one thinks of oneself

C. Values--those personal beliefs about what is desirable and worthwhile; right and just

D. Self-confidence--a belief in oneself and in one's powers and abilities

E. Relations with others--the qualities that make a person likeable, including being genuine and trustworthy

1. Genuineness--means being oneself; genuine people do not put up false fronts to try to look good. Genuine people do not put on an act and are comfortable with themselves.

2. Trustworthiness--the key to building trusting relationships with others is to be trustworthy. When others take risks with you,

you must prove their risks are worth taking.

IV. Techniques for being accepted by fellow employees

A. Try to get along with co-workers.

B. Seek acceptance by co-workers in a job.

C. Accept others' life styles - everyone should learn to respect another person's right to be different.

D. Avoid incorrect assumptions to avoid offending others before all facts are known.

E. Maintain a good appearance because a good first impression will help one on the way toward being accepted.

F. Develop a good attitude. One of the most important factors that determines one's acceptance by others in any environment is attitude.

G. Observe rules. Most hospitals have a set of rules for employees to follow, but there are also unwritten rules that workers are expected to observe.

V. Reasons for employees losing their jobs

A. Inability to get along with fellow employees

B. Poor attendance and lateness for work

C. Abuse of break time

VI. Factors that affect human relations with employers

A. Competence--the ability to perform a required task. As a rule, competent employees get along with their employers.

B. Cooperation--working with others to reach a given goal. The employer who pays your salary has the right to expect your cooperation.

C. Loyalty--a feeling of obligation and devotion to one's employer or job. This includes avoiding complaining to others about your working conditions

D. Initiative--recognizing what jobs need to be done and doing them without being reminded

E. Trustworthiness--the quality that makes one dependable. The employer knows the trustworthy employee will do what is expected and often even more

F. Honesty--qualities of truthfulness, honor and integrity; free of fraud or deception

G. Dependability--being on the job every day, arriving on time, and notifying the employer if one cannot be at work

VII. Basic ways of getting along with people

A. Think before you speak; always say less than you think.

(NOTE: Cultivate a low, persuasive voice. How one says it often counts far more than what is said.)

B. Make promises sparingly and keep them faithfully, no matter what it costs.

C. Be interested in others, in their pursuits, their welfare, their homes, and families. Let all you meet, however humble, feel that you regard them as persons of importance.

D. Never let an opportunity pass to say a kind and encouraging thing to or about somebody.

E. Be cheerful; keep a pleasant smile on your face.

F. Reserve an open mind on all debatable questions. Discuss but do not argue--it is a mark of superior minds to disagree and yet be friendly.

G. Discourage gossip and make a rule to say nothing of another unless it is something good.

H. Be careful of others' feelings. Wit and humor at the other fellow's expense are rarely worth the effort.

VIII. Reasons why people work and set goals

A. To achieve satisfaction

B. To support family

C. To attain acceptance of peers

- D. To gain power
- E. To accumulate wealth

IX. Establishing human relations with patients

- A. Learn to know, understand, and relate to the patient in any situation.
- B. Show sympathy for the patient by being eager to serve and by being of gentle touch.
- C. Realize and understand sick people are sensitive, both emotionally and physically. Sickness causes strain and patients are not always on their best behavior.
- D. Remember to be kind and tolerant when patients are irritable and demanding.
- E. Realize much of the satisfaction assistants derive from their work is due to the relation they develop with the patient.

X. Human relations in communication
(NOTE: Observe XVIII-TM-1.)

- A. Good attitudes enhance communication.
- B. Good communication lowers employee turnover.
- C. Good communication eliminates misunderstanding.
- D. Communication implies two important words: sharing and understanding.
    1. Sharing means that communication involves the action of more than one person. That is, there must be one who sends the message and another who reacts to the message.
    2. Understanding means that both the sender and receiver of the message share the same meaning of what is said in the message. This part of the communication is the most difficult because people tend to give different meanings to the same words. Human relations problems develop because of the failure of people to share and understand messages.

XI. Barriers to good communications in human relations

- A. Humans relation problems may develop because of the failure of people to share and understand messages.

B. When a person uses a word, that word is used with just one meaning.

C. The particular meaning is what that person intends the word to mean.

D. Bypassing is a barrier in communication because one single word or expression is complicated by several different meanings or several different words might have the same meaning.

E. Employers and employees can cause communication problems by misusing language. Two of the most serious communication problems that arise due to the misuse of language are:

1. Labeling or name-calling

    a. Labeling or name-calling--means to unfairly classify someone as a certain type person. Typical labels given to people are

        1) clown--a person who appears to do silly things

        2) trouble-maker--a person who appears to be frequently involved in problems

        3) animal--a person lacking in manners

2. Emotional confusion--words that mean the same thing; some have pleasant sounds while others do not.

    Examples:

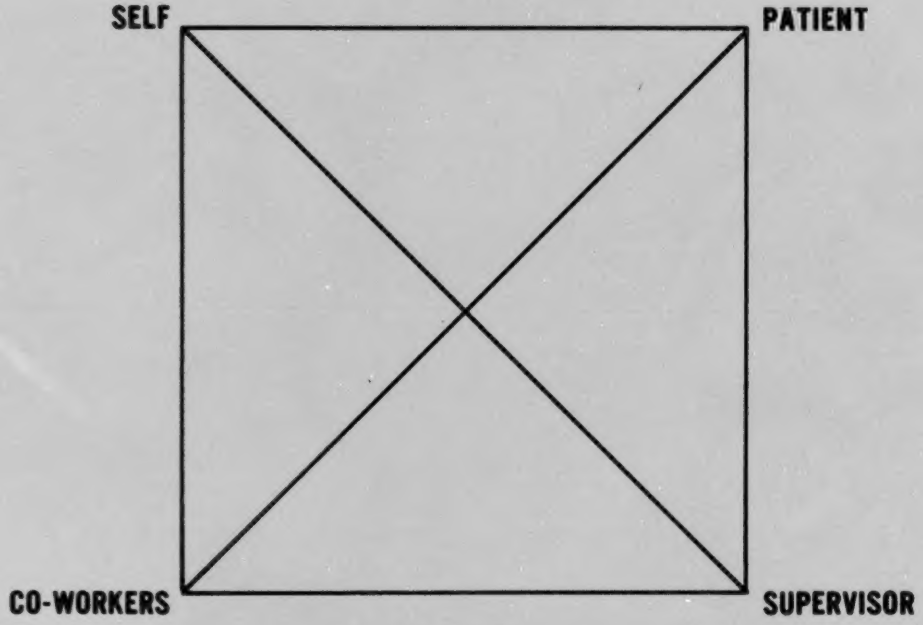
Negative Appeal	Positive Appeal
a. death insurance	a. life insurance
b. garbage collector	b. sanitary engineer
c. stock salesperson	c. investment counselor
d. lie	d. fib
e. pop quiz	e. unscheduled test

    You may avoid emotional confusion in human relations by using as many positive sounding words or titles as possible.

F. Listening--When good listeners do not understand a message, they ask the speaker for a different explanation. Good listeners must be alert. Listening is much more than hearing. The process of listening requires an active mind.

G. Grapevine--The term dates back to the Civil War, when the United States sent secret messages by telegraph line strung through trees and bushes almost like a vine. Today, the term "grapevine" includes all forms of unofficial communication. Messages by way of the grapevine are only about 80 percent reliable.

RELATIONSHIPS WITH PEOPLE



Human relations refer to relationship between people. The relationship can be formal or informal, close or distant, emotional or unemotional. In Health Occupations many kinds of relationships with different people must be considered. As an employee at a hospital you have a relationship with (1) self, (2) co-worker, (3) your supervisor, and (4) the patient.

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

ASSIGNMENT SHEET #1--LEARNING ABOUT CLASS MEMBERS

Directions: This activity will enable you to know the people in your class. You may learn things about them you did not know. You need a partner for this activity. Choose someone you don't know very well. Using this interview data sheet below as a guide, take turns interviewing each other. Write the answers your partner gives to each question. After both data sheets are completed, introduce your partner to the class. Using the notes you wrote during the interview, tell the class about your partner.

INTERVIEW DATA SHEET

Name of interviewer ________________________________

My name ____

1. What is your classification in school? ______________

2. Describe some of the things you do at work. ________
   ____

3. Where do you work? _____________________________

4. What other schools have you attended? ______________
   ____

5. Do you have any brothers or sisters? _______________
   ____

6. Do they work, and if so, where? __________________
   ____

7. What do you do in your spare time? ________________
   ____

8. What is your favorite course here at school? ________
   ____

9. Do you plan to enter the health field after graduation? What field? ____

10. What is the most important thing that happened to you in the past year? ____________________________________

____

____

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

ASSIGNMENT SHEET #2--RATING YOUR MANY SELVES

Directions: This activity is designed to test your self-image. Self-image is what you think of yourself. Try rating yourself in the various scales below. Each scale ranges from 1 to 10. Ten is the highest rating; five is in the middle; and one is the lowest rating.

SELF UNDERSTANDING

My Romantic Self
10 9 8 7 6 5 4 3 2 1
Very Generally Not

My Friendly Self
10 9 8 7 6 5 4 3 2 1
Always Usually Not

My Modest Self
10 9 8 7 6 5 4 3 2 1
Very Generally Not

My Honest Self
10 9 8 7 6 5 4 3 2 1
Always Usually Not

My Greedy Self
10 9 8 7 6 5 4 3 2 1
Always Generally Not

My Clever Self
10 9 8 7 6 5 4 3 2 1
Very Generally Not

My Noisy Self
10 9 8 7 6 5 4 3 2 1
Always Generally Not

My Aggressive Self
10 9 8 7 6 5 4 3 2 1
Always Generally Not

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

ASSIGNMENT SHEET #3--INTERVIEWING AN EMPLOYER

Directions: You should arrange to interview an employer in your community hospital. This activity will provide an opportunity for you to meet an employer and will get you started towards good human relations.

To help you get started, a list of questions you might ask the employer is listed below. In the space provided, jot down the answers given to you during the interview.

1. Why did you choose the medical profession?
____
____
____

2. Why did you choose this particular medical center?
____
____
____

3. Did you set this career goal in high school? __________

4. Do you like your job? Why? ____________________
____
____

5. Does your work sometimes make you irritable or upset?
____
____
____

6. What kind of employee do you get along with best?
____
____
____

7. How many employees do you observe? ______________

8. How long have you been employed? ______________

9. What are your hobbies? ______________________
____
____

10. What is the best part of your job? ______________
____
____

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

ASSIGNMENT SHEET #4--DEVELOPING A RELATIONSHIP WITH A PATIENT

Directions: List any activity you have done for a patient, a family member, or a friend that is ill, within the last month, that you consider good human relations. After you complete your list, compare it with the lists of others in your class.

1. ______
2. ______
3. ______
4. ______
5. ______
6. ______
7. ______
8. ______
9. ______
10. ______

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

ASSIGNMENT SHEET #5--IDENTIFYING MULTIPLE MEANINGS

Directions: Think of as many words as you can that mean the same to you as the words* listed below.

1. Money ________ ________ ________ ________

2. Home ________ ________ ________ ________

3. Car ________ ________ ________ ________

4. Parents ________ ________ ________ ________

5. Teacher ________ ________ ________ ________

6. Friend ________ ________ ________ ________
   Girl
7. Friend ________ ________ ________ ________
   Boy
8. Friend ________ ________ ________ ________

9. Job ________ ________ ________ ________

10. Boss ________ ________ ________ ________

*Money, bread, capital, cash, bank roll, etc.

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

ASSIGNMENT SHEET #6--FINDING COMMON MEANINGS OF WORDS

Directions: Look up the following words in a dictionary. Then count the number of different meanings given for each word. Also indicate the most common meaning of each word.

Word	Number of Meanings	Most common meaning of the word
1. accent		
2. acid		
3. patient		
4. cell		
5. custom		
6. fork		
7. muffler		
8. recover		
9. service		
10. treat		

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

ASSIGNMENT SHEET #7--MEANINGS OF COMMUNICATIONS ARE IN PEOPLE, NOT IN WORDS

Directions: Write a story about a communication problem at school but follow these directions carefully. On a sheet of paper number the lines from 1-25.

1. You begin the story by writing a sentence or part of a sentence on the first line. Do not write on the second line.
2. Give the page to another person in the class. Person #2 should read your sentence and then write a sentence or part of a sentence on the second line. The sentence written by person #2 should continue the story you began.
3. Person #2 must now fold the paper so that the sentence you wrote cannot be seen.
4. Person #2 should give the paper to person #3.
5. Person #3 reads only the sentence written by person #2, then person #3 writes on the third line.
6. Person #3 must now fold the paper so that lines 1 and 2 cannot be seen. Person #3 passes the paper to person #4.
7. Person #4 may only read the sentences or words written on line 3.
8. Other persons in the class should continue adding lines to the story in the same manner. Be sure that the paper is folded so that the next writer sees only the previous line.
9. After everyone in the class has written a line, read the story.
10. Was the story funny? How does the story illustrate the point that meanings are in people, not in words?

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

ASSIGNMENT SHEET #8--BARRIERS IN COMMUNICATIONS

Directions: The first student will begin a sentence by saying to the person on the right side, "Mary is going to fail English this semester." Student #2 repeats the sentence and then adds a word. Student #3 repeats the sentence and adds a word. This procedure is repeated until everyone in the class is given an opportunity to repeat the sentence and add a word. After everyone in class has added a sentence and added a word, discuss the story. How did it begin? Was it funny? How does the story illustrate that one cannot depend on the message from the grapevine to be accurate? Whenever possible, one should ask the supervisor about the accuracy of an informal message. By understanding the limitations of informal communication, you will improve human relations at work.

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

ANSWERS TO ASSIGNMENT SHEETS

ACTIVITIES #1, 2, 3, 4, 5, 6, 7, and 8 will be demonstrated to the satisfaction of the instructor.

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

UNIT TEST

1. Match the term on the right to the correct definition on the left.

_____a. The person for whom you work

_____b. The people with whom you work

_____c. What you know about the job itself

_____d. Knowing how to get along with others

_____e. What you think of yourself

_____f. Personal beliefs about what is desirable and worthwhile

_____g. Something a person does for a short while and then forgets

_____h. Your belief that you are inadequate for your job

_____i. Bold or confident behavior

_____j. An objective,what one plans to achieve

_____k. A feeling or action concerning a particular situation

_____l. Thoughtful and sympathetic regard toward others

1. People knowledge
2. Bypassing
3. Negative self-image
4. Goal
5. Attitude
6. Values
7. Tolerance
8. Positive self-image
9. Competence
10. Technical knowledge
11. Honesty
12. Assertiveness
13. Trustworthiness
14. Loyalty
15. Employer
16. Flattery
17. Fad
18. Personality
19. Co-workers

_____m. The ability to cope with habits or mannerisms of other individuals

_____n. The practice of insincere or excessive praise

_____o. Your belief that you are capable of doing your job

_____p. The point at which others' habits or mannerisms begin to bother one

_____q. The ability to perform a required task

_____r. A feeling of obligation to one's employer or job

_____s. Worthy of confidence

_____t. Qualities of truthfulness, honor and integrity; free of fraud and deception

_____u. Word or expression has different meanings to the speaker and to the receiver

_____v. The complex of characteristics that distinguishes an individual. It is the combination of personal traits that make you different from every other person

_____w. The relationship between people. These relationships can be formal or informal, close or distant, emotional or unemotional

20. Tolerance level

21. Consideration

22. Self image

23. Human relations

2. Discuss the history of Human Relations in Health Occupations.
   a. The company involved
   b. The purpose of the experiment
   c. The result of the experiment

3. List and explain factors involved in self-understanding
   a. Self-acceptance
   b. Self-image
   c. Values

d. Self-confidence

e. Relations with others

4. Discuss technique for being accepted by fellow employees.

   a.

   b.

   c.

   d.

   e.

f.

g.

5. Identify reasons why employees lose their jobs.

   a.

   b.

   c.

6. Explain factors that affect human relations with employers.

7. Cite basic ways of getting along with people.

   a.

   b.

   c.

   d.

   e.

   f.

   g.

8. List reasons why people work and set goals.

   a.

   b.

   c.

   d.

   e.

9. Discuss establishment of human relations with the patient.

10. Discuss human relations in communication.

11. List and discuss barriers to good communication.

12. Interview class members.
13. Rate individual self-image.
14. Interview an employer.
15. Practice the development of a relationship between a patient and the attendant.
16. List multiple meanings of familiar terms.
17. List common meanings of words.
18. Write a communication problem.
19. Participate in situations using "grapevine" information.

(NOTE: If Activities #12-19 have not been completed prior to the test, ask the instructor when they should be completed.)

UNIT XVIII

HUMAN RELATIONS IN HEALTH OCCUPATIONS

ANSWERS TO UNIT TEST

1. a. 15
   b. 19
   c. 10
   d. 1
   e. 22
   f. 6
   g. 17
   h. 3
   i. 12
   j. 4
   k. 5
   l. 21
   m. 7
   n. 16
   o. 8
   p. 20
   q. 9
   r. 14
   s. 13
   t. 11
   u. 2
   v. 18
   w. 23

2. Discussion should include:

   a. The company involved with the human relations experiment was Western Electric Company of Ohio.

   b. The purpose of the experiment was to see if lighting would have an effect on production of parts.

   c. The result of the experiment--The workers increased production during the experiment with and without lighting. The company found out that workers were motivated by special treatment they had received during the experiment. They increased production not because of the lighting but rather because of the special treatment received during the experiment. This created a new concept in the world of work called human relations.

3. List and explanation should include:

   a. Self-acceptance--to accept yourself as you are

b. Self-image--Self-image is what you think of yourself.

c. Values--Those personal beliefs about what is desirable and worthwhile, right and just.

d. Self-confidence--A belief in oneself and in one's powers and abilities.

e. Relations with others--There are many valuable qualities that make a person likeable. Two qualities that make people like a person are:

   1) Being genuine

   2) Being trustworthy

   Being genuine means being yourself. Genuine people do not put up false fronts to try to look good. Genuine people do not put on an act. Genuine people are confortable with themselves.

   Trustworthiness--The key to building trustworthy relationships with others is to be trustworthy yourself. When others take risks with you, you must prove that their risks are worth taking.

4. Discussion should include:

   a. Try to get along with co-workers

   b. Seek acceptance by co-workers in a job

   c. Accept others' life styles

   d. Avoid offending others before all facts are known

   e. Maintain a good appearance. A good first impression will help you on your way toward being accepted.

   f. Develop a good attitude. One of the most important factors that determines one's acceptance by others in any environment is attitude.

   g. Observe rules. Most hospitals have a set of rules for employees to follow, but there are also unwritten rules that workers are expected to observe.

5. Identification should include:

   a. Unable to get along with fellow employees

   b. Poor attendance and lateness for work

c. Abuse of break time

6. Explanation should include:

   a. Competence--The ability to perform a required task. As a rule, competent employees get along well with their employers.

   b. Cooperation--Working with others to reach a given goal. The employer who pays your salary has a right to expect your full cooperation.

   c. Loyalty--A feeling of obligation and devotion to one's employer or job. This includes avoiding complaining to others about your working conditions.

   d. Initiative--Recognizing what jobs need to be done and doing them without being reminded.

   e. Trustworthiness--The quality that makes one dependable. The employer knows the trustworthy employee will do what is expected and often even more.

   f. Honesty--Qualities of trustfulness, honor, and integrity; free of fraud or deception.

   g. Dependability--Be on the job daily and arrive on time. The employer expects you to call if you are ill.

7. Basic ways of getting along with people include the following:

   a. Think before you speak. Always say less than you think.

   b. Make promises sparingly and keep them faithfully, no matter what it costs.

   c. Never let an opportunity pass to say a kind and encouraging thing to or about somebody.

   d. Be interested in others.

   e. Be cheerful.

   f. Reserve an open mind on all debatable questions.

   g. Discourage gossip.

   h. Be careful of others' feelings.

8. List should include:
    a. Satisfaction
    b. Support family
    c. Acceptance of peers
    d. Power
    e. Wealth

9. Discussion should include:
    a. Learn to know, understand, and relate to patients in any situation.
    b. A good health assistant shows sympathy for the patient by being eager to serve and by being of gentle touch.
    c. The assistant must realize and understand sick people are very sensitive, both emotionally and physically. Sickness puts a very great strain on a person. Under this strain, people are not always on their best behavior.
    d. The attendant must remember to be kind and tolerant when patients are irritable and demanding.
    e. Much of the satisfaction an assistant derives from the work is due to the human relations they develop with the patient.

10. Discussion should include:
    a. Good attitudes enhance communication
    b. Good communication lowers employee turnover.
    c. Good communication eliminates misunderstanding.
    d. Communication contains two important words: sharing and understanding.
        1) Sharing means that communication involves the action of more than one person. That is, there must be one who sends the message and another who reacts to the message.
        2) Understanding means that both the sender and the receiver of the message share the same

meaning of what is said in the message. This part of communication is most difficult to achieve because people tend to give different meanings in some words. Human relations problems develop because of the failure of people to share and understand messages.

11. List and discussion should include:

    a. Human relations problems may develop because of the failure of people to share and understand messages.

    b. When a person uses a word, that word is used with just one meaning.

    c. The particular meaning is what that person intends the word to mean.

    d. Bypassing is a barrier in communication because one single word or expression is complicated by several different meanings or several different words might have the same meaning.

    e. Employees and employers can cause communication problems by misusing language. Two of the most serious communication problems that arise due to the misuse of language are: (1) labeling or name calling and (2) emotional confusion.

        1) Labeling or name calling means to unfairly classify someone as a certain type person. Typical labels given to people are

            a) clown--a person who appears to do silly things

            b) trouble maker--a person who appears to be frequently involved in problems

            c) animal--a person lacking in manners

        2) Emotional confusion--words that mean the same thing; some have pleasant sounds while others do not.

        Examples:

Negative Appeal	Positive Appeal
a. death insurance	a) life insurance
b. garbage collector	b) sanitary engineer

c)	stock salesperson	c)	investment counselor
d)	lie	d)	fib
e)	pop quiz	e)	unscheduled test

You want to avoid emotional confusion in human relations by using as many positive sounding words or titles as possible.

f. Listening--When good listeners do not understand a message, they ask the speaker for a different explanation. A good listener must be alert. Listening is much more than hearing. The process of listening requires an active mind.

g. Grapevine--The term dates back to the Civil War, when the United States sent secret messages by telegraph line strung through trees and bushes almost like a vine. Today, the term "grapevine" includes all forms of unofficial communication. Messages by way of grapevine are only about 80 percent reliable.

#12.-#20. Evaluated to the satisfaction of the instructor.

UNIT XIX

SAFETY

UNIT OBJECTIVE

After completion of this unit the student will be aware of the need for safety, will recognize hazards at the medical facility, and will be able to demonstrate safety practices.

SPECIFIC OBJECTIVES

After completing this unit of instruction the student will be able to:

1. Define safety and safety attitudes
2. Discuss causes of accidents
3. Identify the Occupational Safety and Health Act (OSHA)
4. List safety precautions in patient care
5. Identify safety precautions in the use of oxygen
6. List safety precautions in housekeeping in the medical facility
7. Identify safety practices in the medical laboratory
8. Explain safety practices in the use of X-ray
9. List safety practices in dental assisting
10. List safety measures for pharmacy
11. Discuss fire safety in the medical facility
12. Cite general safety reminders

UNIT XIX

SAFETY

SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide objective sheet

  B. Discuss objective sheet

  C. Pass out information sheet

  D. Discuss information sheet

  E. Make and show transparency

  F. Distribute and discuss assignment sheets

  G. Give test and evaluate results

  H. Invite guest speaker from Department of Labor to clarify OSHA regulations

II. Student:

  A. Read objective sheet

  B. Participate in discussion of objective sheet

  C. Read information sheet

  D. Participate in discussion of information sheet

  E. View transparency

  F. Complete assignment sheets

  G. Take test

  H. Listen to guest speaker's presentation

INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objectives

  B. Information sheet

C. Transparency masters

1. XIX-TM-1--Do Not Leave Bed Cranks Extended
2. XIX-TM-2--Avoid Hazards in Transporting Patients on a Stretcher
3. XIX-TM-3--Clean Spills From Floor Immediately
4. XIX-TM-4--Avoid Hazards in Pharmacy
5. XIX-TM-5--Do Not Climb to Reach Equipment Without a Safety Ladder
6. XIX-TM-6--Approach Intersections With Care

D. Assignment sheets

1. Assignment Sheet #1--Safety Practices in the Various Areas of the Medical Facility
2. Assignment Sheet #2--List of Hazards at Work
3. Assignment Sheet #3--Floor Plan at Work
4. Assignment Sheet #4--Word Find Puzzle
5. Assignment Sheet #5--Identification of Common Hazards in the Medical Facility

E. Answers to assignment sheets

II. References:

A. Books

Anderson, Pauline C. The Dental Assistant. Albany, N.Y.: Delmar Publishers, 1974.

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Cherescavich, G.D. Textbook for Nursing Assistants. 3rd ed. 3207 Washington Blvd., St. Louis, Missouri: C.V. Mosby Co., 1973.

Donovan, Joan E. and others. The Nurse Assistant. 2nd ed. St. Louis: McGraw-Hill, 1978.

Eastman Kodak. The Fundamentals of Radiography. Rochester, N.Y.: Eastman Kodak Company, 1968.

Linne, Jean J. and Karen M. Ringsrud. Basic Laboratory Techniques for the Medical Laboratory Technician. St. Louis, Missouri: McGraw-Hill, 1970.

Stolten, Jane Henry. The Health Aide. Boston, Massachusetts: Little, Brown, and Co., 1972.

Strong, Merle E. Accident Prevention Manual for Training Programs. The University of Wisconsin, Madison Wisconsin: American Technical Society, 1975.

B. Filmstrips

OSHA Regulations for the Hospital
P821 A-"Overview of OSHA"
P821 B-"OSHA Regulations for the Hospital"
Eye-Gate Pro-Tech Media. 146-01 Archer Avenue, Jamaica, N.Y. 11435

"Safety in Housekeeping." #136. Trainex Corporation, P.O. Box 116, Garden Grove, CA 92642.

"How's Your Safety Profile." #315. Trainex Corporation, P.O. Box 116, Garden Grove, CA 92642.

"How To Work All Day Without Getting Hurt." #316. Trainex Corporation, P.O. Box 116, Garden Grove, CA 92642.

"...do the Sick No Harm." #317. Trainex Corperation, P.O. Box 116, Garden Grove, CA 92642.

"Patient Safety: From Thermometers to Wheelchairs". #318. Trainex Corporation, P.O. Box 116, Garden Grove, CA 92642.

"The Hospital: A Place Where Accidents Never Happen?" #320. Trainex Corporation, P.O. Box 116, Garden Grove, CA 92642.

"Protecting Yourself and Your Patient From Electrical Shock". #322. Trainex Corporation, P.O. Box 116, Garden Grove, CA 92642.

"Hospital Fire Safety Procedures". #163. Trainex Corporation, P.O. Box 116, Garden Grove, CA 92642.

"Hospital Fire Hazards". #164. Trainex Corporation, P.O. Box 116, Garden Grove, CA 92642.

"Fire Extinguishing Equipment". #167. Trainex Corporation, P.O. Box 116, Garden Grove, CA 92642.

UNIT XIX

SAFETY

INFORMATION SHEET

I. Introduction

Safety means freedom from danger, risks, or injury. Health attendants are particularly concerned with safety. Not only are they interested in their own personal safety, and that of their co-workers, but they are responsible for the safety of patients entrusted to their care.

Health attendants should develop a safety attitude. An attitude is a mental pattern, or a way of reacting to a situation. Attitudes are learned, and can be changed by knowledge and experience. Thus, a safety attitude is a way of reacting to hazardous, or unsafe conditions, that will protect both you and your patient.

II. Causes of accidents

A. Individual behavior

1. Poor judgment--lack of ability to recognize or accept potential danger
2. Physical limitations--lack of physical ability to avoid or prevent danger
3. Lack of training--individual not adequately instructed, or experienced enough, to avoid accidents

B. Hazardous environment

1. Dangers cannot always be avoided because they exist everywhere.
2. Recognition and identification of hazards help to control them.

III. Occupational Safety and Health Act--1970

A. Federal legislation that assures safe and healthful working conditions for every person who works in this country. All employers must conform to these federal laws.

B. Through OSHA, the Secretary of Labor can establish and enforce safety and health standards for all workers.

IV. Safety precautions in patient care

A. Safety measures for bed patients

1. Lower the bed before assisting patients out of bed. This helps the patient avoid falling.
2. Do not leave bed cranks extended, bed wheels turned out, or footstools in the way.
3. Be sure patient is aware of, and uses, hand rails in bathrooms to avoid slipping.
4. Psychiatric patients may need especial security to protect themselves and other patients or personnel.

B. Transporting patients in a wheelchair

1. Push wheelchair from behind except when going in and out of elevators or down ramps.
2. Fasten safety straps to hold patient securely in chair.
3. Do not let the patient's clothing or bed covering drag on the floor.
4. Always set the brake when the chair is still.
5. Never leave a patient unattended in a wheel chair. Always notify person in charge when you have delivered a patient.
6. Always park wheelchairs in a safe place where they will not interfere with traffic.

C. Transporting patient on a stretcher

1. Strap patient onto stretcher with arms at side or folded against chest.
2. Cover patient, but do not allow cover to drag because it could become caught in stretcher wheels.
3. Stand at patient's head and push the stretcher.

4. Never move a stretcher at a fast pace.

5. Never leave a patient unattended on a stretcher until you have notified the person in charge.

6. Always set the brakes on a parked stretcher to avoid rolling.

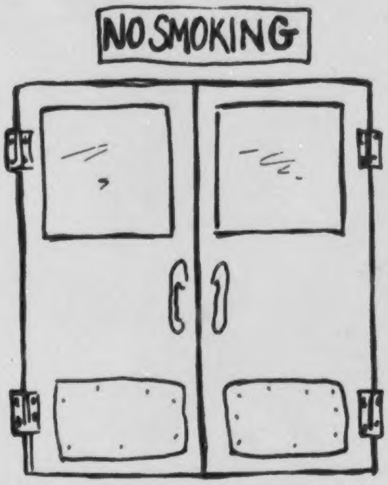
V. Safety precautions in the use of oxygen

A. Oxygen itself does not burn, but it supports combustion.

B. Post a No Smoking sign on the patient's door.

C. Post a No Smoking sign on the oxygen cylinder or the oxygen piping system outlet.

D. Do not use any electrically operated equipment (heating pads, call signals, radios) at the bedside when oxygen is in use.



E. Silk, wool, or synthetic fabrics can cause sparks. The attendant and patient should wear cotton fabric and cotton bed linens should be used when the patient is receiving oxygen.

F. Flammable materials such as grease and oils must not come in contact with equipment used in administering oxygen (valves, hoses, cylinders). The attendant's hands must be free of grease and oil.

G. Oil, alcohol, or lotion must not be used when giving back rubs to patients receiving oxygen.

H. Do not permit the lighting of ritual candles at the bedside when oxygen is in use.

VI. Safety practices in housekeeping in the medical facility

A. Wheel heavy, awkward cleaning equipment. Do not try to carry it.

B. Clean spills from floor immediately.

C. When mopping hall floors, place caution signs conspicuously to warn people of slippery floors.

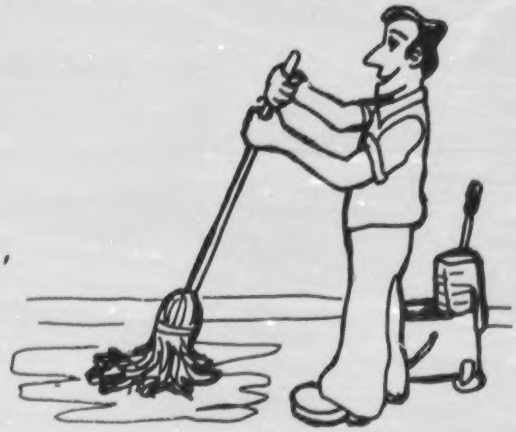
D. Do not overwax floors or use scatter rugs.

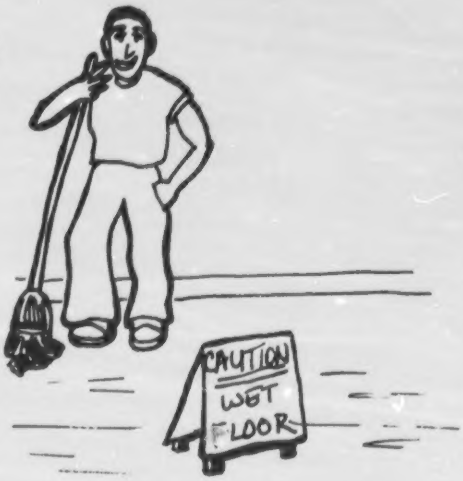
E. Store equipment out of the way when not in use. Avoid clutter in the working area.

F. Check linens for pins before sending to the laundry.

G. Replace or repair frayed or worn electrical cords or plugs.

H. Replace burned out light bulbs at once.





VII. Safety practices in the medical laboratory

A. Be sure all equipment is in working condition prior to use.

1. Avoid using broken glassware

2. Do not use stretched or cracked tubing

B. Carefully follow prescribed procedure in handling contaminated materials.

C. In using a Bunsen burner, be sure tubing is short, intact, and securely fastened. The flame should be clean and blue.

D. Never use mouth suction to pipette strong acids or bases. Use pipettes plugged with cotton when pipetting live cultures.

E. Know location and how to use safety shower if one is available.

F. The best protection is a healthy awareness of dangers present in chemicals and test materials.

G. Handle any specimen from a patient (e.g., blood, urine, sputum, or feces) as though it were contaminated.

VIII. Safety practices for X-ray

A. Exposure to radiation

1. Skin, gonads, and blood forming organs are particularly sensitive to X-rays and should be protected.

2. Any body tissue will be injured by overexposure to X-rays.

3. Film badges should be worn by all roentgenological personnel to indicate amount of radiation being received.

4. Protective lead gloves and aprons should be worn by X-ray personnel at appropriate times.

5. Minimize radiation hazard to patients by avoiding "re-takes". Try to get correct picture the first time.

IX. Safety practices in dental assisting

A. Familiarize yourself with instructions accompanying pieces of equipment prior to use (as vibrators, model trimmers, and lathes).

B. Be sure to use the proper instrument for the assigned task

C. Pass any instrument with handles first and the working point away from receiver.

D. Dental (X-ray) personnel should never hold dental films in the patient's mouth during radiography.

X. Safety measures for pharmacy

A. Keep all medicines and poisons in a safe place.

B. Label all containers.

C. Do not leave filled bottles or other containers uncapped.

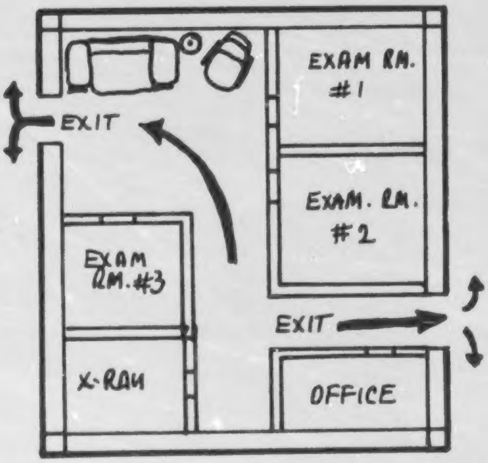
D. Narcotics or any other drug with a potential for abuse must be kept in a locked case.

XI. Fire safety in the medical facility

A. Practice fire drills as outlined by the facility, but always take care to avoid disturbing patients.

B. Know the floor plan of the entire medical facility, and of your particular work area.

C. Know the exact location of exits, and the most efficient routes to the exits.



D. Learn exactly where fire alarms and fire extinguishers are located and how to use them.

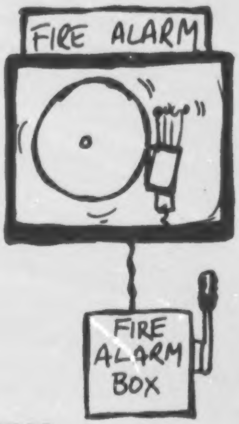
E. If a fire should start:

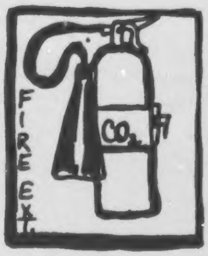
1. Pull the handle on the nearest fire alarm box.

2. Tell the main switchboard the exact location and nature of the fire.

3. Follow emergency procedures as practiced.

4. Do not panic; avoid alarming patients unduly.





F. Use safety matches only.

G. Designate Smoking and No Smoking areas.

H. Take especial care to protect patients who have been given sedatives, are comatose, restrained, or otherwise helpless.

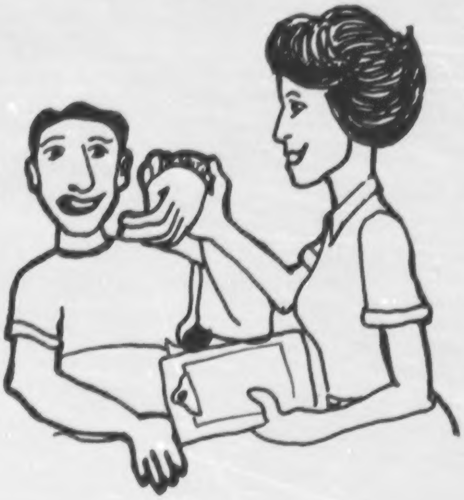
XII. General safety reminders

A. Always identify patient prior to any procedures.

B. Avoid climbing when you must reach items stored on high shelf; use a safety ladder.

C. Avoid horseplay and practical jokes.

D. Report any unsafe condition or equipment that you observe.



E. Walk, never run; always look where you are going; take care at intersections.

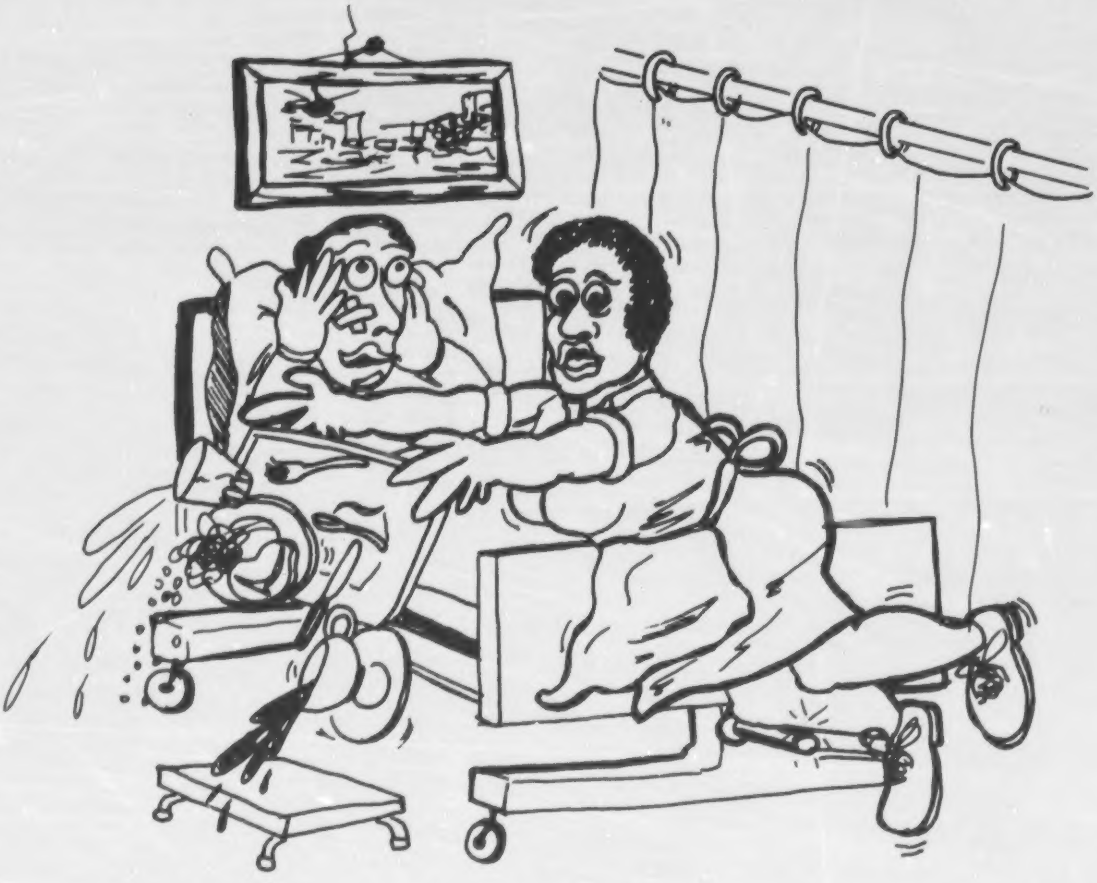
F. Open swinging doors cautiously and slowly.

G. Keep drawers and cabinet doors closed when not in use.

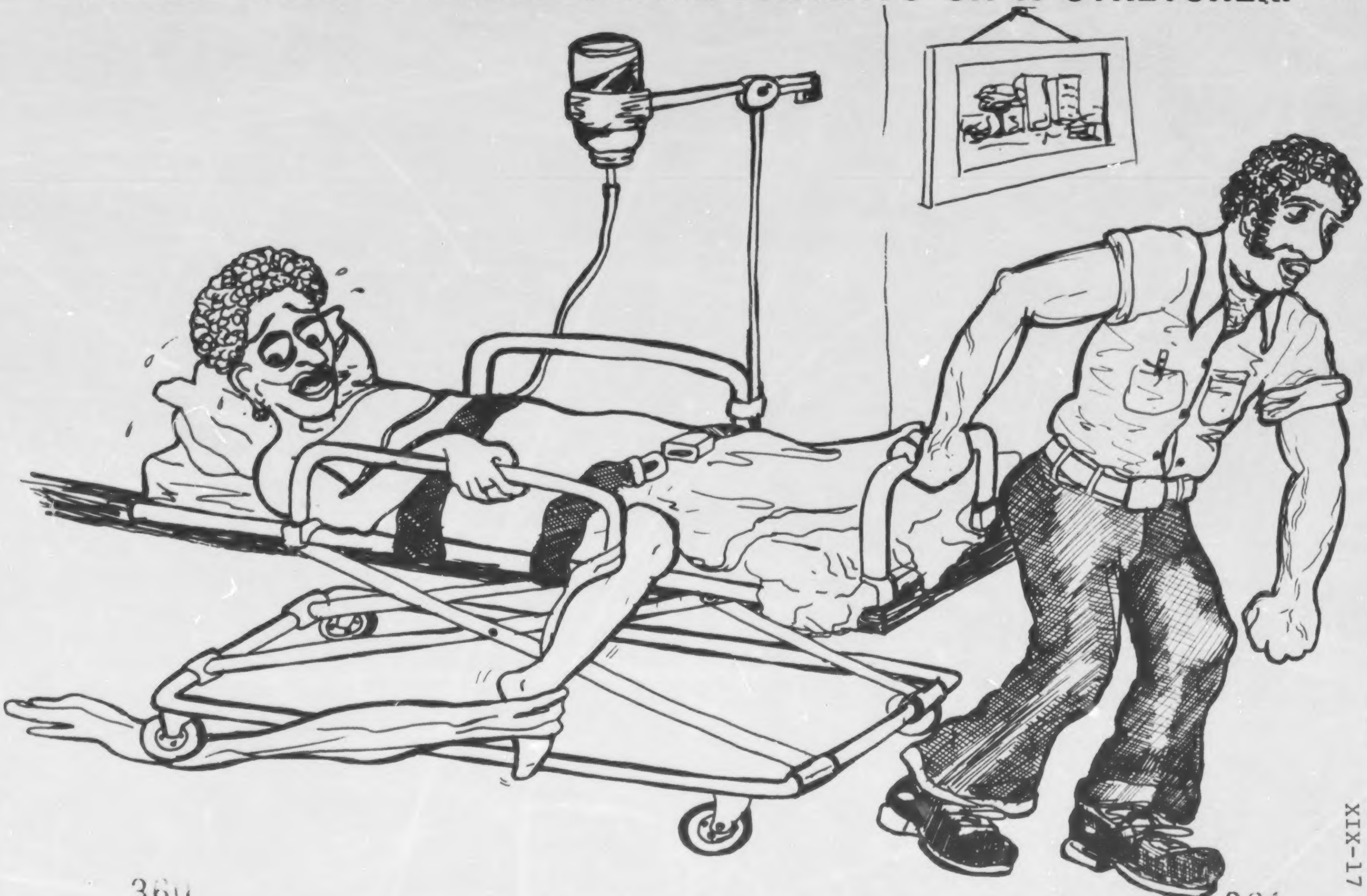
H. Remember that children require special attention and care to prevent accidents.

I. Think safety--develop a safety attitude.

DO NOT LEAVE BED CRANKS EXTENDED!



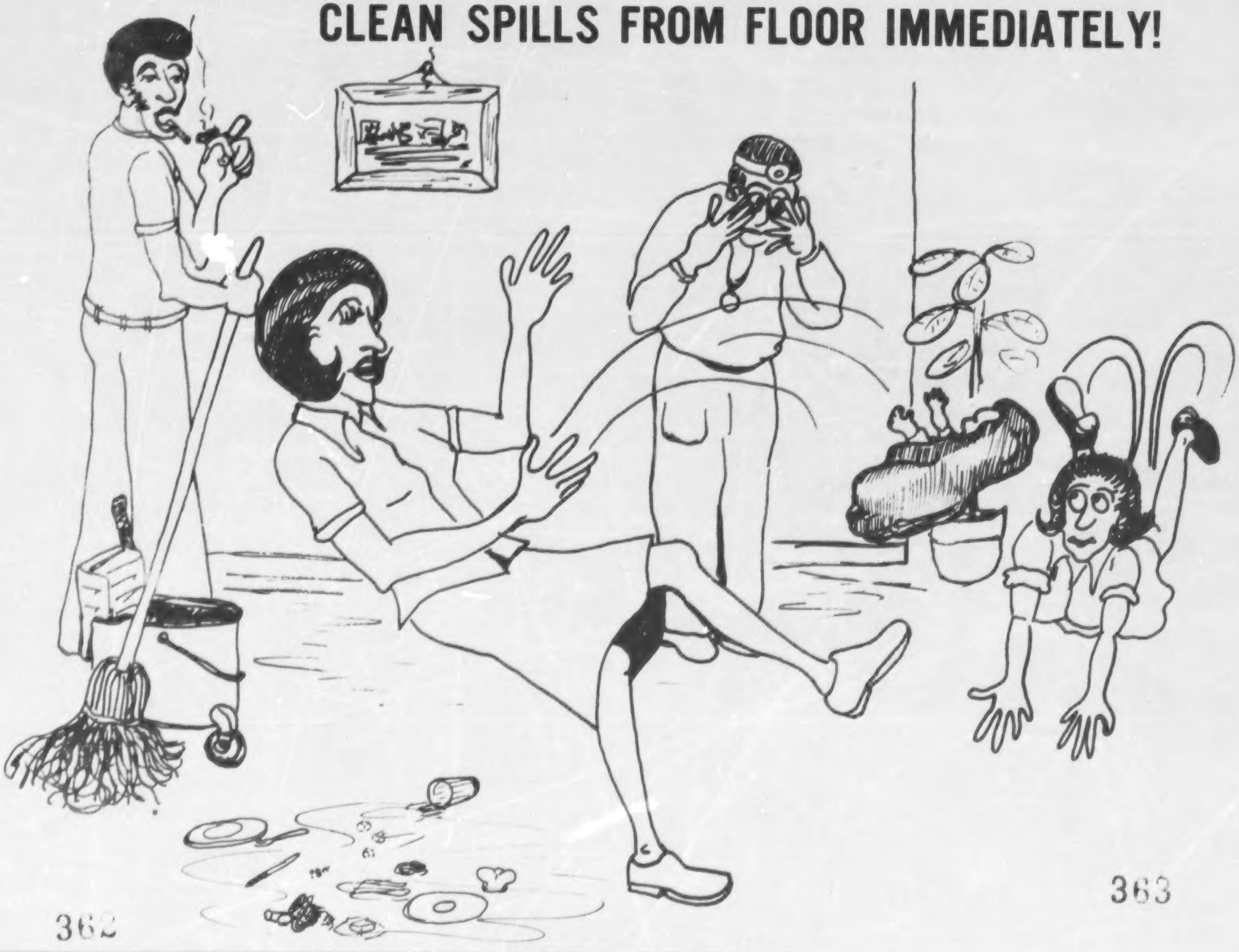
AVOID HAZARDS IN TRANSPORTING PATIENTS ON A STRETCHER!



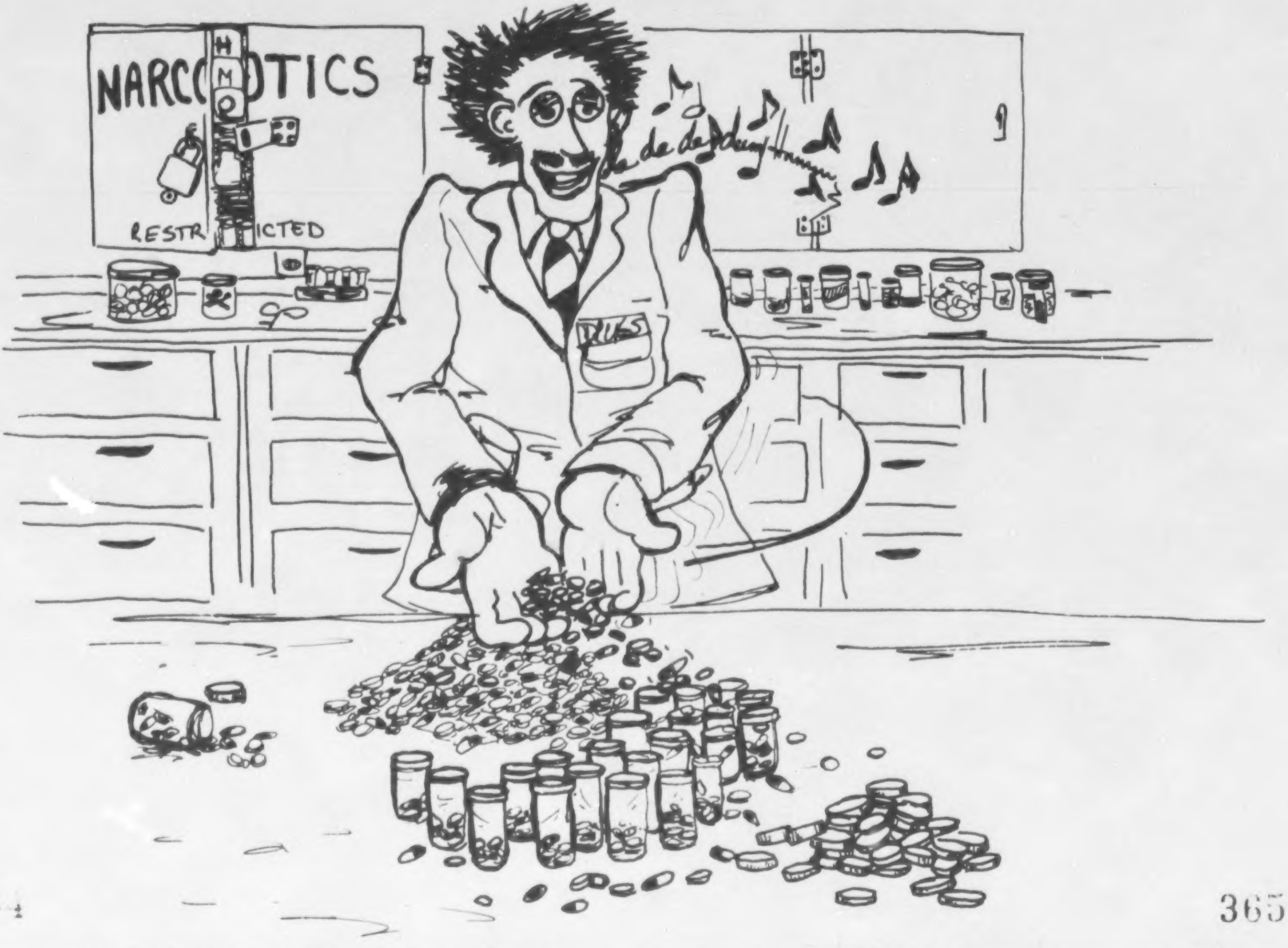
XIX-TM-2

XIX-17

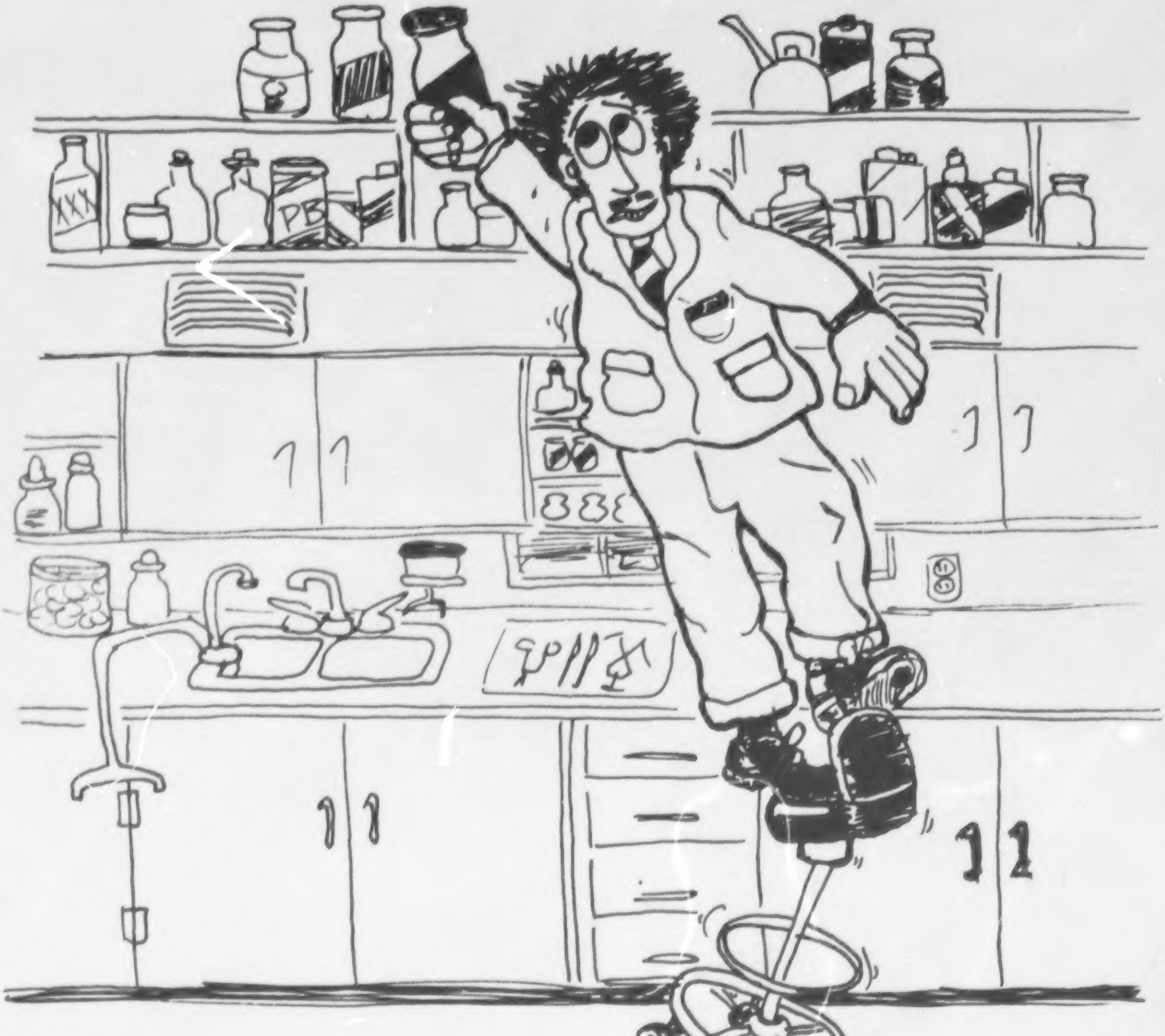
CLEAN SPILLS FROM FLOOR IMMEDIATELY!



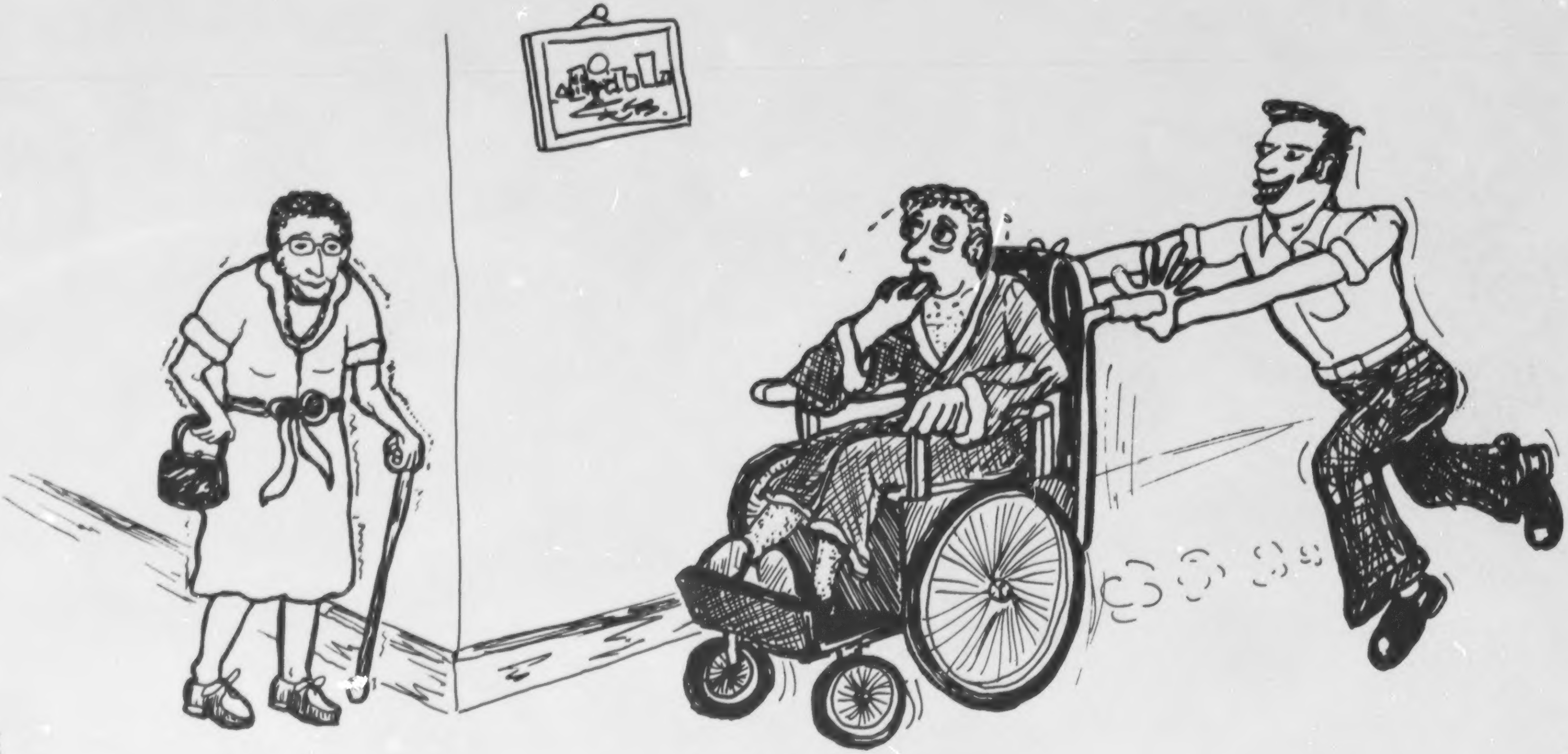
AVOID HAZARDS IN THE PHARMACY!


NARCOTICS
HMO
RESTRICTED
la de da dum

DO NOT CLIMB TO REACH EQUIPMENT WITHOUT A SAFETY LADDER!



APPROACH INTERSECTIONS WITH CARE!



UNIT XIX

SAFETY

ASSIGNMENT SHEET #1--SAFETY PRACTICES IN VARIOUS AREAS OF THE MEDICAL FACILITY

Select any two items in the information sheet from IV through XII. Write a paragraph explaining why each of the areas of safety you've chosen are very important where you work.

UNIT XIX

SAFETY

ASSIGNMENT SHEET #2--HAZARDS AT WORK

List any hazards you can find where you work, describe them, and tell how such hazards could be eliminated.

UNIT XIX

SAFETY

ASSIGNMENT SHEET #3--FLOOR PLAN AT WORK

Sketch a floor plan of the place where you work. Show location of fire alarm, fire extinguisher, and exits. (If you work in a multi-level building, show route you would take to leave the building.)

UNIT XIX

SAFETY

ASSIGNMENT SHEET #4--WORD FIND PUZZLE

Directions: The following words pertaining to safety can be found in the word find puzzle. They may be vertical, horizontal, or diagonal. Circle each word as you find it.

- accident
- alarm
- attitude
- brakes
- caution
- danger
- extinguisher
- flammable
- handrail
- hazard
- instrument
- judgment
- limitation
- OSHA
- precaution
- radiation
- safety
- stretcher
- wheelchair

C	S	B	N	O	I	T	U	A	C	E	R	P
W	A	T	T	I	T	U	D	E	D	O	F	C
T	H	A	N	D	R	A	I	L	M	X	D	J
N	I	E	S	I	D	A	N	G	E	R	W	N
E	T	N	E	D	I	C	C	A	A	T	N	O
M	U	M	K	L	U	P	T	Z	A	N	O	I
U	B	R	A	X	C	L	A	F	T	E	I	T
R	D	A	R	U	A	H	S	O	S	M	T	A
T	E	L	B	A	M	M	A	L	F	G	A	T
S	S	A	F	E	T	Y	L	I	C	D	I	I
N	S	T	R	E	T	C	H	E	R	U	D	M
I	M	B	N	O	I	T	U	A	C	J	A	I
E	X	T	I	N	G	U	I	S	H	E	R	L

UNIT XIX

SAFETY

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

Evaluated to the satisfaction of the instructor

Assignment Sheet #2

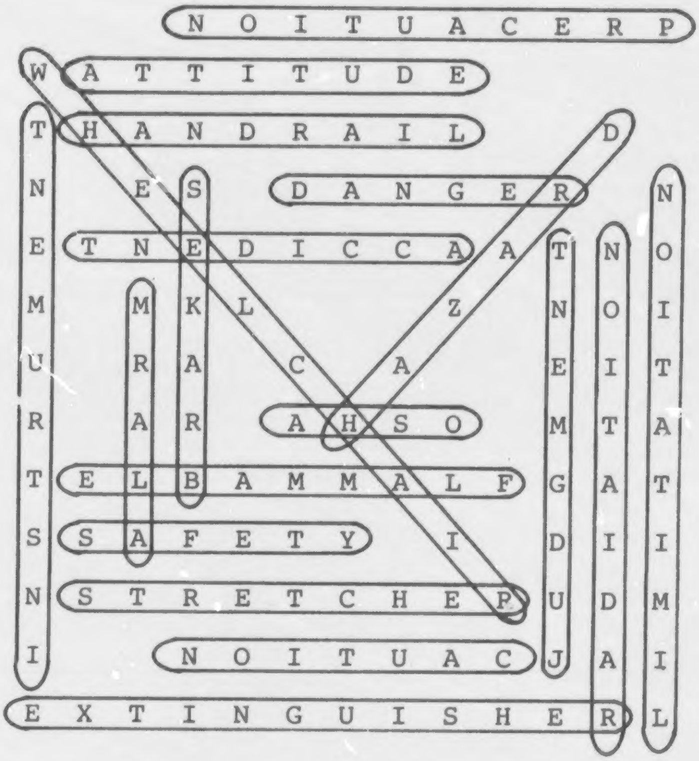
Evaluated to the satisfaction of the instructor.

Assignment Sheet #3

Evaluated to the satisfaction of the instructor.

Assignment Sheet #4

accident
alarm
attitude
brakes
caution
danger
extinguisher
flammable
handrail
hazard
instrument
judgment
limitation
OSHA
precaution
radiation
safety
stretcher
wheelchair


N O I T U A C E R P
W A T T I T U D E
T H A N D R A I L D
N E S D A N G E R N
E T N E D I C C A A T N O
M M K L Z N O I
U R A C A E I T
R A R A H S O M T A
T E L B A M M A L F G A T
S S A F E T Y I D I I
N S T R E T C H E R U D M
I N O I T U A C J A I
E X T I N G U I S H E R L

UNIT XIX

SAFETY

UNIT TEST

1. A. Define safety.

   B. Define safety attitude.

2. Discuss three ways in which individual behavior may cause an accident.

   A.

   B.

   C.

3. A. What do the letters O.S.H.A. stand for?

   B. What is the purpose of OSHA?

4. A. List three safety measures for bed patients.

   1.

   2.

   3.

B. List five safety measures for transporting patients in a wheelchair.

1.

2.

3.

4.

5.

C. List five safety measures for transporting patients on a stretcher.

1.

2.

3.

4.

5.

5. Complete the following statements by choosing the correct word from those listed after each statement.

A. Oxygen itself does not burn, but it ______________. (inhibits fires, supports combustion, blazes)

B. When oxygen is in use, a sign saying ____________ should be placed on the door. (No smoking, no tobacco, no entry)

C. Do not use ______________ equipment at the bedside when oxygen is in use. (manual, surgical, electrically operated)

D. The fabric that does not cause sparks and thus may be used for clothing and bed linens when a patient receives is(linen, synthetic fiber,cotton).

E. The patient must not receive ____________ while receiving oxygen. (oil back rubs, baths using soap, medication)

6. List seven safety practices in housekeeping.

A.

B.

C.

D.

E.

F.

G.

7. In the following statements, write True or False in the spaces provided.

A. __________ Be sure all equipment is in working order before use.

B. __________ Carefully follow prescribed procedures in handling contaminated materials.

C. __________ The flame from a Bunsen burner should be golden-yellow.

D. __________ Mouth suction should be used to pipette strong acids or bases.

E. __________ Know the location of and how to use the safety shower.

8. Answer the following questions using short anwsers, words or phrases.

A. Name three body parts that are particularly sensitive to X-rays.

1.

2.

3.

B. What is the purpose of film badges?

C. What articles of clothing containing lead should be worn to protect X-ray personnel?

D. Why should "re-takes" be avoided?

IX. List three safety practices in dental assisting.

A.

B.

C.

X. List three safety measures for pharmacy.

A.

B.

C.

XI. Answer the following questions about fire safety using short answers.

A. List four items you should be able to locate in case of fire.

1.

2.

3.

4.

B. What is the first step to take if a fire should start?

C. Who should be notified first if a fire should start?

D. What information should be given to person notified in question C?

E. What kind of matches should be used in the medical facility?

F. Which patients should be especially protected in case of fire?

XII. List any seven general safety measures.

A.

B.

C.

UNIT XIX

SAFETY

ANSWERS TO UNIT TEST

1. A. Safety means freedom from danger, risks, or injury.

   B. Safety attitude is a way of reacting to hazardous or unsafe conditions.

2. Discussion should include:

   A. Poor judgment, or the lack of ability to recognize or accept potential danger

   B. Physical limitations, or the lack of physical ability to avoid or prevent danger

   C. Lack of training, or a health attendant not having adequate instruction or experience to avoid accidents

3. A. Occupational Health and Safety Act

   B. The purpose of OSHA is to assure safe and healthful working conditions for every person who works in this country.

4. A. Answer should include three of the following:

      1. Lower the bed prior to assisting the patient out of bed

      2. Do not leave bed cranks extended, bed wheels turned out, or footstools in the way

      3. Be sure the patient is aware of and uses hand rails in bathroom to avoid slipping

      4. Psychiatric patients may need especial security to protect themselves and other patients or personnel

   B. Answer should include five of the following:

      1. Push wheelchair from behind except when going in and out of elevators or down ramps

      2. Fasten safety straps to hold patient securely in chair

3. Do not permit patient's clothing or covering to drag the floor
4. Always set the brake when the chair is still
5. Never leave a patient unattended in a wheelchair. Always notify person in charge when you have delivered a patient
6. Always park wheelchairs in a safe place where they will not interfere with traffic

C. Answer should include five of the following:

1. Strap patients onto stretcher with arms at side or folded against chest
2. Cover patient, but do not allow cover to drag, because it could be caught in stretcher wheels
3. Stand at patient's head and push stretcher
4. Never move stretcher at a fast pase
5. Never leave a patient unattended on a stretcher until you have notified the person in charge
6. Always set the brakes on a parked stretcher to avoid rolling

5. A. Supports combustion

B. No smoking

C. Electrically operated

D. Cotton

E. Oil back rubs

6. Answer should include any seven of the following:

A. Wheel heavy, awkward cleaning equipment

B. Clean spills from floor immediately

C. When mopping floors, place caution signs conspicuously

D. Do not overwax floors or use scatter rugs

E. Store equipment out of the way when not in use. Avoid clutter in the work area

F. Check linen for pins before sending to laundry

G. Replace or repair frayed or worn electrical cords or plugs

H. Replace burned out light bulbs at once

7. A. True

B. True

C. False

D. False

E. True

8. A. 1. skin

2. gonads

3. blood-forming organs

B. Indicate amount of radiation being received

C. Gloves and aprons

D. Radiation hazard to patient

9. Answer should include any three of the following:

A. Familiarize yourself with instructions accompanying pieces of equipment prior to use

B. Be sure to use proper instruments for assigned task

C. Pass any instrument with handles first and working point away from receiver

10. Answer should include any three of the following:

A. Keep all medicines and poisons in a safe place

B. Label all containers

C. Do not leave filled bottles or other containers uncapped

D. Narcotics, or any other drug with a potential for abuse must be kept in a locked case

11. A. 1. fire extinguisher
    2. fire alarm
    3. exits
    4. routes to exits

    B. Pull handle on fire alarm box

    C. Switchboard operator

    D. Exact location and nature of fire

    E. Safety

    F. Patients given sedatives, those comatose, restrained or otherwise helpless

12. Answer should include any seven of the following:

    A. Always identify patient prior to any procedure

    B. Avoid climbing when you must reach items stored on a high shelf, use a safety ladder

    C. Avoid horseplay and practical jokes

    D. Report any unsafe condition or equipment that you observe

    E. Walk, never run. Always look where you are going, take care at intersections

    F. Open swinging doors cautiously and slowly

    G. Keep drawers and cabinet doors closed when not in use

    H. Remember that children require special attention and care to prevent accidents

    I. Think safety--develop a safety attitude

UNIT XX

ANATOMY AND PHYSIOLOGY

UNIT OBJECTIVE

After completing this unit the student will be able to identify terms and label diagrams pertaining to anatomy and physiology. The student will also be able to locate, describe, and give the function of body parts, and identify diseases and disorders.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to accomplish the following:

1. Objectives pertaining to organization and general plan of the body
    a. Locate body cavities and list contents
    b. Identify body directions
    c. Recognize body directions
    d. Label diagrams of body cavities and body planes
2. Objectives pertaining to the skeletal and muscular systems
    a. Identify terms pertaining to the skeletal and muscular systems
    b. List the functions of the skeleton
    c. Recognize the divisions of the skeleton
    d. Identify bone injuries and disease
    e. List types of muscles
    f. Label diagrams of the skeleton
3. Objective pertaining to the digestive system
    a. Identify terms pertaining to the digestive system

   - b. List the major organs of the digestive system and give the function of each
   - c. Complete a chart of the digestive juices and enzymes
   - d. Recognize diseases and disorders of the digestive system
   - e. Label the diagram of the digestive system

4. Objectives pertaining to the circulatory system
   - a. List the functions of the blood
   - b. Describe the components of the blood
   - c. Discuss the ABO blood types
   - d. Discuss the Rh blood factor
   - e. Identify the parts of the heart in a diagram
   - f. Define pulse and blood pressure
   - g. Recognize diseases and disorders of the circulatory system

5. Objectives pertaining to the respiratory system
   - a. Identify terms pertaining to the respiratory system
   - b. List the parts of the respiratory system and give their location and function
   - c. Identify terms used for types of abnormal breathing
   - d. Recognize respiratory diseases and disorders
   - e. Label the diagram of the respiratory system

6. Objectives pertaining to the nervous system
   - a. List the three divisions of the nervous system
   - b. Identify the main divisions of the brain
   - c. Define meninges and cerebrospinal fluid, and give the function of each

- d. Give the structure and function of a neuron
- e. Label a diagram of the eye and discuss the physiology of vision
- f. Label a diagram of the ear and discuss the physiology of hearing
- g. List five general senses
- h. Recognize diseases and disorders of the nervous system
- i. Label the diagram of the brain
- j. Label the diagram of a neuron

7. Objectives pertaining to the urinary system
    - a. Identify terms pertaining to the urinary system
    - b. List the parts of the urinary system and the functions of each
    - c. Discuss the general functions of the urinary system
    - d. Give four steps in the formation of urine
    - e. Identify diseases and disorders of the urinary system
    - f. Discuss dialysis and transplants
    - g. Define the "Living Bank"
    - f. Label the diagram of the urinary system

8. Objectives pertaining to the reproductive system
    - a. Identify terms pertaining to the reproductive system
    - b. Identify parts of the female and male reproductive systems
    - c. Review the sequence of events in the menstrual cycle
    - d. Summarize events in pregnancy
    - e. Recognize disorders of pregnancy

   f. Identify diseases and disorders of the reproductive system

9. Objectives pertaining to the endocrine glands

   a. Identify terms pertaining to the endocrine system

   b. Locate and discuss the function of the following endocrine glands: pituitary, thyroid, parathyroid, adrenal, Islets of Langerhans, and sex glands

   c. Recognize diseases and disorders caused by dysfunction of endocrine glands

   d. Label the diagram of the endocrine glands

UNIT XX

ANATOMY AND PHYSIOLOGY

SUGGESTED ACTIVITIES

I. Instructor

- A. Provide and discuss objective sheet
- B. Distribute and discuss information sheet
- C. Make and show transparencies
- D. Distribute and discuss assignment sheets
- E. Demonstrate procedures outlined in assignment sheets
- F. Use models or charts of body parts to explain anatomy and physiology
- G. Invite resource speakers to discuss specific topics (e.g., dialysis, organ transplants, and donor banks)
- H. Give test and evaluate results

II. Student

- A. Read and discuss objective sheet
- B. Read and discuss material contained in information sheet
- C. View transparencies and take notes
- D. Complete assignment sheets, or perform procedures described
- E. Observe or participate in demonstration of body parts or functions, using models or charts
- F. Listen to presentations of speakers
- G. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objective sheet

   B. Information sheets

   C. Transparency masters

      1. XX-TM-1--Location of Body Cavities, Lateral View

      2. XX-TM-2--Human Body, Lateral and Posterior Views

      3. XX-TM-3--Skeleton, Anterior View

      4. XX-TM-4--Skeleton, Posterior View

      5. XX-TM-5--Parts of the Digestive System

      6. XX-TM-6--Digestive Juices and Enzymes

      7. XX-TM-7--The Heart

      8. XX-TM-8--Parts of the Respiratory System

      9. XX-TM-9--Parts of the Brain

      10. XX-TM-10--Neuron

      11. XX-TM-11--Parts of the Eye

      12. XX-TM-12--Parts of the Ear

      13. XX-TM-13--The Urinary System

      14. XX-TM-14--Endocrine Glands

   D. Assignment Sheets:

      1. Assignment Sheet #1--Label Diagram of Body Cavities

      2. Assignment Sheet #2--Label Diagrams of Human Body, Lateral View and Posterior View

      3. Assignment Sheet #3--Label Diagram of Skeleton, Anterior View

4. Assignment Sheet #4--Label Diagram of Skeleton, Posterior View
5. Assignment Sheet #5--Questions About the Skeletal and Muscular Systems
6. Assignment Sheet #6--Label Parts of the Digestive System
7. Assignment Sheet #7--Identify Enzymes and Their Actions
8. Assignment Sheet #8--Word Find Puzzle
9. Assignment Sheet #9--Label Diagram of Heart
10. Assignment Sheet #10--Scrambled Letter Puzzle
11. Assignment Sheet #11--Label Diagram of Respiratory System
12. Assignment Sheet #12--Label Diagram of the Brain
13. Assignment Sheet #13--Label Diagram of a Neuron
14. Assignment Sheet #14--Label Diagram of the Eye
15. Assignment Sheet #15--Label Diagram of the Ear
16. Assignment Sheet #16--Word Find Puzzle
17. Assignment Sheet #17--Label Diagram of the Urinary System
18. Assignment Sheet #18--Word Scramble
19. Assignment Sheet #19--Identification of Function of Parts of the Reproductive System
20. Assignment Sheet #20--Word Scramble
21. Assignment Sheet #21--Word Find Puzzle
22. Assignment Sheet #22--Label Diagram of Endocrine Glands

E. Answers to Assignment Sheets

F. Test

G. Answers to test

II. References:

A. Books

1. Anderson, Paul D. Clinical Anatomy and Physiology for Allied Health Sciences. Philadelphia: W. B. Saunders, 1976.

2. Anthony, Catherine P. Basic Concepts in Anatomy and Physiology. 3rd ed. St. Louis: C. V. Mosby Co., 1974.

3. Anthony, Catherine P., and I. B. Alyn, Structure and Function of the Human Body. 4th ed. St. Louis: C. V. Mosby Co., 1972.

4. Anthony, Catherine P., and Norma Jane Kolthoff. Textbook of Anatomy and Physiology. 9th ed. St. Louis: C. V. Mosby co., 1975.

5. Caldwell, Esther and Barbara R. Hegner. Health Assistant. Albany, NY: Delmar Publishers, 1973.

6. Francis, C. C. Introduction to Human Anatomy. 6th ed. St. Louis, Missouri: C. V. Mosby Co., 1975.

7. Jacob, Stanley W. and Clarice A. Francone. Structure and Function in Man. 3rd ed. Philadelphia: W. B. Saunders Co., 1974.

8. Memmler, Ruth L. and Dena L. Wood. Wookbook for the Human Body In Health and Disease. 2nd ed. Philadelphia: Lippincott, 1977.

UNIT XX

ANATOMY AND PHYSIOLOGY

INFORMATION SHEET

I. Organization and general plan of the body

  A. Body cavities

    1. Thoracic cavity

      a. space above diaphragm, enclosed by rib cage

      b. contains trachea, esophagus, heart, and lungs

    2. Abdominal cavity

      a. ventral space below diaphragm

      b. contains stomach, large and small intestine, kidneys, liver, gall bladder, spleen, urinary bladder, and some reproductive organs

    3. Cranial cavity

      a. located in skull

      b. contains brain

    4. Spinal cavity

      a. located in vertebral column

      b. contains spinal cord

  B. Body planes

    1. Frontal plane--divides body into anterior and posterior sections

    2. Sagittal plane--divides body into right and left sections

    3. Transverse plane--divides body into upper and lower sections

  C. Body directions

    1. Superior--toward the head, upper, above

2. Inferior--toward the feet, lower, below
3. Anterior--front, in front of
4. Posterior--back, in back of
5. Medial--toward the midline
6. Lateral--away from the midline, toward the side of
7. Proximal--toward or near the trunk of the body, near the point of origin
8. Distal--away from the point of origin

II. Skeletal and muscular systems

A. Identification of terms

1. Abduction--motion away from midline of the body, as raising arm to a shelf (Fig. 1)

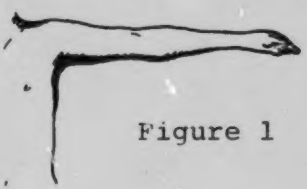


Figure 1

2. Adduction--motion toward the midline of the body (Fig. 2)

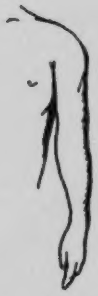


Figure 2

3. Flexion--decrease in the angle between two bones at their joint (Fig. 3)

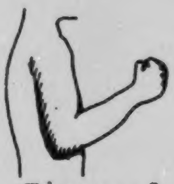


Figure 3

4. Extension--movement that straightens bones at their joint (Fig. 4)

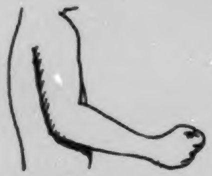


Figure 4

5. Joint--point of juncture of two or more bones
6. Ligament--tissue which connects bones at a joint
7. Synovial fluid--lubricating fluid of joints
8. Tendon--tissue which connects muscles to bone

B. Functions of the skeleton
    1. Supports and gives shape to the body
    2. Protects internal organs
    3. Makes movement possible
    4. Produces blood cells

C. Divisions of skeleton
    1. Axial skeleton
        a. skull
            (1) cranium
            (2) face
        b. vertebral column
        c. thorax
            (1) ribs
            (2) sternum
    2. Appendicular skeleton
        a. upper extremities--shoulder girdle, arms, and hands
        b. lower extremities--hip girdle, legs, and feet

D. Bone injuries and disease
    1. Fracture
        a. simple fracture--bone is broken, but there is no external wound
        b. compound fracture--bone is broken, skin and soft tissues are torn
        c. greenstick fracture--incomplete break in which the bone is partially broken and partially bent
    2. Dislocations--displacement of bone from its normal position in a joint. The ligaments may be torn and stretched

3. Bone disorders and diseases
    a. arthritis--inflammation of bones at joints
    b. bursitis--inflammation of the bursa. A bursa is a sac or cavity filled with synovial fluid
    c. kyphosis--increase in the curvature of the spine resulting in a hunchbacked appearance
    d. lordosis--exaggerated inward curvature in the lumbar region of the spinal column
    e. osteomyelitis--inflammation of the bone
    f. rickets--failure of bones to calcify sufficiently, hampering growth
    g. scoliosis--side-to-side curvature of the spine
    h. sprain--injury to ligaments resulting from wrenching of a joint
    i. tuberculosis--bone disease caused by tubercle bacillus

E. Types of muscles

1. Skeletal or voluntary muscles--provide for voluntary body movement. Examples are chewing, movements of head, or walking
2. Smooth or involuntary muscles--muscles contract independently of the will. Examples are muscles of the blood vessels and digestive tract
3. Cardiac muscle-- forms the heart wall and produces heartbeats

III. The digestive system

A. Identification of terms

1. Absorption--the taking up of fluids or other substances by the skin or mucous membrane
2. Alimentary canal--the continuous tube which extends from the mouth to the anus. The process of digestion takes place in the alimentary canal

3. Bile--digestive juice secreted by the liver
4. Defecation--the discharge of fecal material from the anus
5. Digestion--the changing of insoluble food materials to a soluble form by the action of enzymes
6. Enzyme--the protein substances produced by the cells that bring about chemical reactions in digestion
7. Feces--body waste, residue of digestion, discharged from anus
8. Malnutrition--the lack of needed food in the body or improper absorption and distribution of food by the body

B. Parts of the digestive system

1. Mouth
    a. functions of the mouth are to receive food and prepare it for digestion; and speech
    b. structures contained in mouth
        (1) tongue--used in speech, to guide food, and contains taste buds which identify sweet, bitter, salt, and sour
        (2) teeth--cut, grind, and tear food
            (a) 20 baby teeth (deciduous)
            (b) 32 permanent adult teeth
        (3) three pairs of salivary glands--produce saliva, which dissolves food in the mouth. Saliva contains the enzyme pytalin, which digests starch
2. Pharynx (throat)--contains tonsils,which are lymphatic tissue. Tonsils guard the entrance of the digestive and respiratory systems from bacterial invasion
3. Esophagus--tube connecting the pharynx and stomach. No digestion occurs in the esophagus

4. Stomach--receives swallowed food, secretes gastric juices, mixes food with gastric juice, and absorbs some drugs, water, and alcohol.

5. Small intestine--completes digestion of food begun in the stomach; end products of digestion are absorbed into blood and lymph

6. Large intestine--absorbs water, eliminates waste products of digestion through anus

7. Accessory organs of digestive system

   a. liver--secretes bile, forms antibodies

   b. gall bladder--stores and concentrates bile; ejects bile into duodenum as needed during digestion

   c. pancreas--secretes pancreatic juice containing digestive enzymes. The pancreas also manufactures insulin, which regulates glucose metabolism

   d. appendix--small blind tube extending from large intestine at junction of small and large intestine. Its function is not understood

C. Digestive juices

1. Saliva--contains the enzyme ptyalin which changes starch to double sugar

2. Gastric juice--contains hydrochloric acid and enzymes

   a. action of hydrochloric acid

      (1) softens connective tissue in meat

      (2) kills some pathogenic bacteria

      (3) activates gastric enzymes

   b. action of enzymes

      (1) pepsin--begins protein digestion

      (2) lipase--digests fats

3. Pancreatic juice--contains enzymes

   a. amylopsin--acts on starches

   - b. trypsin--acts on proteins
   - c. lipase--acts on fats

4. Intestinal juice--contains enzymes
   - a. lactase--changes complex sugar to simple sugar
   - b. maltase--changes complex sugar to simple sugar
   - c. sucrase--changes complex sugar to simple sugar

5. Bile--breaks down fats (emulsifies fats)

D. Disorders and diseases of digestion system

1. Mouth and teeth
   - a. dental caries--tooth decay
   - b. gingivitis--inflammation of gums
   - c. mumps--viral infection of salivary glands
   - d. pyorrhea--inflammation of tooth socket
   - e. stomatitis--inflammation of lining of mouth

2. Stomach
   - a. flatulence--excessive amount of gas in stomach or intestine
   - b. gastritis--inflammation of the lining of the stomach
   - c. heartburn--burning sensation in anterior part of the stomach
   - d. nausea--stomach distress with an urge to vomit
   - e. ulcer--an area of the lining of the stomach or small intestine in which the tissues are gradually disintegrating
   - f. vomiting--reverse peristalsis causing ejection of the stomach contents through the mouth

3. Small and large intestine

    a. appendicitis--inflammation of the appendix

    b. constipation--abnormal delay in, or infrequent bowel movement

    c. diarrhea--abnormally frequent, watery, bowel movements

    d. dysentery--inflammation of the lining of the intestines, with diarrhea

4. Liver

    a. cirrhosis--chronic disease in which normal liver cells are replaced by scar tissue

    b. hepatitis--inflammation of the liver

5. Gall bladder

    a. cholecystitis--inflammation of the gall bladder

    b. cholelithiasis--presence of stones in gall bladder

6. Pancreas

    a. diabetes--disease in which sugar is not used by the cells because of a lack of insulin. This is not a digestive disorder

    b. pancreatitis--inflammation of the pancreas

IV. The circulatory system

A. Functions of blood

1. Transportation

    a. blood carries oxygen and nutrients from digestive and respiratory systems, and delivers them to each cell

    b. blood carries waste products from cells to excretory organs

        (1) carbon dioxide from cells to lungs

        (2) other waste products of metabolism to kidneys

2. Defense against disease
    a. white blood cells combat bacterial invasion
    b. antibodies

B. Components of blood

1. Plasma--liquid part of blood. May contain digested food, metabolic wastes, carbon dioxide, oxygen, hormones, or enzymes

2. Formed elements
    a. red blood cells (erythrocytes)
        (1) contain hemoglobin; formed in red bone marrow
        (2) transport oxygen from lungs to cells, and carbon dioxide from cells to lungs
    b. white blood cells (leucocytes)
        (1) formed in bone marrow or lymph tissue
        (2) destroy invading bacteria
    c. platelets (thrombocytes)--tiny fragments of bone marrow cells; required for clotting of blood

C. A, B, O blood types

1. The population is divided into four blood groups called A, B, AB, or O. The types are distinguished by the presence or absence of specific proteins on the surface of the red blood cells or in the blood serum

2. Blood type is important in transfusion, and for medical-legal identification

D. Rh factor

1. The Rh factor is another protein factor on red blood cells, separate from A, B, O proteins

2. Rh positive blood means the Rh factor (protein) is present on the red blood cells. (85% of the U.S. population is Rh positive)

3. Rh negative blood means no Rh antigen is present on red blood cells

4. The Rh factor is important in transfusion and pregnancy

E. Heart structure and function (see TM-7)

1. Cavities of the heart

   a. septum--muscular partition separating the right and left sides of the heart

   b. right atrium--upper chamber of the heart, which receives returning venous blood high in carbon dioxide content

   c. tricuspid valve--valve between right atrium and right ventricle. All valves of the heart prevent the backward flow of blood

   d. right ventricle--lower chamber of the heart,which receives blood from the right atrium, then sends blood to the lungs

   e. pulmonic (semilunar) valve--valve between right ventricle and pulmonary artery

   f. left atrium--receives blood high in oxygen content from the lungs

   g. mitral valve--valve between left atrium and left ventricle

   h. left ventricle--receives blood from left auricle, pumps oxygenated blood to body

   i. aortic (semilunar) valve--valve between left ventricle and aorta

F. Pulse and blood pressure

1. Pulse is the rhythmic throbbing felt in an artery as a result of the beating of the heart

2. Blood pressure--pressure blood exerts on the inside walls of blood vessels

   a. systolic--pressure during heart muscle contraction

   b. diastolic--pressure during relaxation of heart muscle

G. Diseases and disorders of the circulatory system

   1. Anemia--condition in which the blood is deficient in the number of red blood cells or in hemoblobin

   2. Aneurysm--abnormal dilatation of blood vessels

   3. Arteriosclerosis--thickening, hardening, and loss of elasticity of blood vessels

   4. Atherosclerosis--a disorder of the lining of arteries in which fat is deposited on the artery walls

   5. Coronary occlusion--closing off of a coronary artery

   6. Coronary thrombosis--closing a coronary artery by a blood clot

   7. Embolus--blood clot, or foreign material carried by the blood stream into a small blood vessel causing obstruction

   8. Hemorrhage--copius bleeding

   9. Hypertension--high blood pressure

   10. Ischemia--insufficient blood supply to a given part of the body

   11. Murmur--abnormal heart sound

   12. Phlebitis--inflammation of a vein

   13. Thrombus--blood clot

   14. Varicose veins--dilatation of veins, usually in legs

V. The respiratory system

   A. Identification of terms

      1. Breathing--inhaling and exhaling air

      2. Cyanosis--bluish color of skin caused by oxygen deficiency in the blood

3. Diffusion--moving of molecules from a region of higher concentration to a region of lower concentration of molecules

4. Eupnea--normal respiration

5. Exhalation--expulsion of air from alveoli of lungs

6. External respiration--exchange of oxygen and carbon dioxide in the lungs

7. Inhalation--phase during which air is drawn into the lungs

8. Internal respiration--exchange of carbon dioxide and oxygen in body cells

B. Organs of respiration

1. Nasal cavity (nostrils)--air enters respiratory system through nostrils

2. Sinuses--cavities in bones of skull,which open into the nasal cavity

3. Pharynx--(also included in digestive system) extends from mouth to esophagus; provides passageway for air from nostrils to trachea

4. Larynx--at upper end of trachea; contains vocal cords

5. Trachea--short tube extending from larynx to bronchi. Protected from collapse by "C"-shaped cartilage rings

6. Bronchi--branches of trachea leading to lungs

7. Lungs--pair of lobed organs in chest cavity. The lungs extend from the diaphragm to the clavicle

    a. the lungs are actually made up of tiny thin-walled air sacs called alveoli

    b. the actual exchange of oxygen and carbon dioxide takes place in the alveoli of the lungs

8. Diaphragm--muscle separating the abdominal and chest cavities. The contraction of the diaphragm causes air to enter the lungs

9. Pleura--serous membrane that covers the lungs and lines the chest cavity

C. Types of abnormal respiration

1. Hyperpnea--abnormally increased breathing
2. Apnea--cessation of breathing
3. Cheyne--Stokes respiration--respirations gradually increase in rapidity and volume until they reach a climax, then gradually subside, cease entirely for a few seconds, then begin the cycle again
4. Anoxia--lack of oxygen
5. Asphyxia--an oxygen deficiency with a resulting increase of carbon dioxide in the tissues

D. Diseases and disorders of the respiratory system

1. Asthma--allergic reaction in which the walls of the small bronchioles swell with a thick mucus secretion
2. Common cold--most widespread of all communicable diseases, characterized by swollen and inflamed mucous membrane of the nose and throat,with copious discharge
3. Cough--mechanism for clearing obstructions from airway
4. Emphysema--swelling of alveoli due to chronic bronchial obstruction
5. Epistaxis--nose bleed
6. Hay fever--sensitivity to foreign proteins causing watery discharge from eyes and nose
7. Influenza--acute, contagious disease characterized by inflammation of the upper respiratory tract and generalized aches and pains
8. Pleurisy--inflammation of the pleura, usually accompanies infections of the lung
9. Pneumonia--inflammation of the alveoli of the lung, may be caused by bacteria or viruses

10. Sinusitis--inflammation of a sinus
11. Tuberculosis--inflammation of lungs and pleurae,caused by a bacterium. (Occasionally invades other parts of the body)

VI. The nervous system

A. Divisions of the nervous system

1. Central nervous system consisting of brain and spinal cord
2. Peripheral nervous system consisting of nerves extending to outlying parts of the body
3. Autonomic nervous system which controls involuntary functions of the body

B. Brain parts and functions

1. Cerebrum--the largest part of the brain, contains cells that control voluntary movement, thinking, sensations of pain, sight, hearing,and touch
2. Cerebellum--coordinates muscular activities and balance
3. Pons--transmits messages from cerebrum to cerebellum and from brain to medulla. The pons also controls some reflex actions
4. Medulla--transmits impulses between brain and spinal cord. The medulla also controls centers for heartbeat, respiration,and blood pressure

C. Spinal cord

1. Lies within spinal canal of vertebral column
2. Serves as two-way conduction path between the brain and nerves
3. Covered by three layers of tissue,the meninges, which surround and protect both the spinal cord and the brain
4. Cerebrospinal fluid--fluid that surrounds and protects the spinal cord and brain

D. Neuron--nerve cell body and its extensions; transmits impulses

   1. Structure

      a. dendrite--projections that transmit impulses to the nerve cell body

      b. axon--projection that transmits impulses away from the nerve cell body

   2. Function

      a. impulses travel from the axon of one neuron to the dendrite of the following neuron

      b. the minute space between the axon and dendrite of two neurons in called a synapse

E. The structure and function of the eye

   1. Parts of the eye

      a. sclera--outer, tough, white tissue which gives shape to and protects eyeball

      b. cornea--transparent, colorless, continuation of the sclera through which light rays enter the eye

      c. choroid--middle layer of the eye which supplies blood to the other eye parts

      d. iris--forward extension of choroid layer, colored part of the eye

      e. pupil--opening at the center of the iris which allows light to enter the eye

      f. ciliary body--muscle which supports and modifies the shape of the lens

      g. retina--inner layer of eye which actually translates light waves to nerve impulses

      h. optic nerve--nerve that transmits nerve impulses from retina to brain

      i. lens--transparent, colorless, biconvex structure that focuses light rays entering the eye on the retina

2. Accessory organs which protect the eye are the eyebrows, eyelashes, eyelids,and lacrimal apparatus which produces tears

3. Physiology of vision

   a. light rays enter eye through cornea

   b. lens changes thickness to focus rays on retina

   c. retina translates light energy to nerve impulses

   d. nerve impulses are conducted to visual center of cerebrum

F. The structure and function of the ear

1. External parts of ear

   a. pinna (auricle)--projecting part of ear

   b. auditory canal (meatus)--canal which extends to middle ear

2. Middle ear

   a. tympanic membrane (eardrum)

   b. eustachian tube--tube leading from middle ear cavity to throat, equalizes pressure on eardrun

   c. ossicles--(tiny bones)

      (1) malleus (hammer)--attaches to tympanic membrane

      (2) incus (anvil)--attaches to malleus

      (3) stapes (stirrup)--attaches to oval window of inner ear

   d. oval window--opening between middle ear and inner ear. Covered by membrane

3. Inner ear

   a. cochlea--contains receptors which, when stimulated, transmit nerve impulses to auditory nerve

    b. semicircular canals--concerned with equilibrium

    c. auditory nerve--transmits nerve impulses from inner ear to brain

4. Physiology of hearing

    a. sound waves enter external auditory canal

    b. tympanic membrane vibrates, causing ossicles to vibrate

    c. vibrations are transmitted mechanically from ossicles to oval window

    d. vibrations of oval window cause pressure waves in liquid of cochlea

    e. nerve centers in cochlea are stimulated by pressure waves, impulses are transmitted from cochlea, by means of the auditory nerve, to the hearing center of the brain

G. General senses--other senses include taste, smell, touch, pain, hunger, thirst, pressure, temperature, and position

H. Diseases and disorders of the nervous system and special senses

1. Astigmatism--an irregularity of the lens or cornea of the eye, resulting in faulty vision

2. Cerebral palsy--congenital brain disorder, characterized by diverse disorders of muscles varying from weakness to complete paralysis

3. C.V.A. (cerebrovascular accident)--destruction of brain tissue as a result of hemorrhage from cerebral blood vessels

4. Encephalitis--inflammation of the brain

5. Epilepsy (falling sickness)--chronic disorder with abnormality of brain function without apparent changes in nerve tissue

6. Glaucoma--impaired vision or blindness as a result of excess pressure of eye fluid

7. Hydrocephalus (water on the brain)--gross enlargement of the cranium and atrophy of the brain due to the accumulation of excessive amounts of fluid in and around the brain

8. Hyperopia--defect in vision in which light rays focus behind the retina (farsightness)

9. Meningitis--inflammation of the membrane covering the brain and spinal cord

10. Multiple sclerosis--chronic, slowly progressive disease of the central nervous system due to degeneration of axons

11. Myopia--defect in vision in which light rays focus in front of the retina (nearsightness)

12. Neuralgia--severe, sharp pain along the course of a nerve

13. Otitis media--inflammation of the middle ear

14. Paralysis--temporary or permanent loss of function, especially loss of sensation or voluntary motion

15. Poliomyelitis--an acute viral disease which affects the brain and spinal cord. The virus may destroy nerve cells,causing paralysis

16. Shingles--formation of blisters along the course of a nerve, most frequently the intercostal nerves

17. Strabismus (crossed-eyes)--muscles of eyeballs do not coordinate; the two eyes do not work together

18. Vertigo--sense of movement of self or surroundings; dizziness

VII. The urinary system

A. Identification of terms

1. Albumin--a protein found in blood; may be present in urine in some disease conditions

2. Catheter--a tube for removing fluids from or injecting fluids into a body cavity, as the urinary bladder

   3. Cystoscope--instrument used for interior examination of urinary bladder or ureters

   4. Dialysis--Diffusion of dissolved substance through a semipermeable membrane

   5. Enuresis--involuntary bed-wetting in children over three years of age

   6. Excretion--the elimination of waste products from the body

   7. Micturition--urination

   8. Transplant--transfer of tissue or organ from one person to another

   9. Urea--chief nitrogenous constituent of urine, an end product of protein metabolism

B. Parts of the urinary system

   1. Kidneys--pair of bean-shaped organs located on the posterior abdominal wall behind the peritoneum at about the level of the first lumbar vertebra

   2. Ureters--tubes extending from the kidneys to the urinary bladder

   3. Urinary bladder--muscular bag in which urine collects

   4. Urethra--tube passing from urinary bladder to exterior of the body

C. Functions of the urinary system

   1. Excretion of waste products from the blood

   2. Regulation of water balance of the body

   3. Regulation of acid-base balance of the body

D. Formation of urine

   1. Blood flows to kidney by means of renal artery

   2. Waste products such as urea, creatinine, uric acid,and various salts, are filtered from the blood by structures within the kidney

3. The waste is called urine, and flows from the kidney by means of the ureter to the urinary bladder

4. The filtered blood returns to the circulating blood

E. Disorders of the urinary system

1. Anuria--complete urinary suppression or failure of kidney function

2. Calculus--kidney stone

3. Cystitis--inflammation of the bladder

4. Dysuria--painful urination

5. Edema--condition in which body tissues contain an excessive amount of tissue fluid

6. Glycosuria--presence of glucose in the urine

7. Incontinence--inability to retain urine

8. Nephritis (Bright's disease)--severe inflammation of the kidney

9. Oliguria--diminished amount of urine formed

10. Polyuria--excessive secretion and discharge of urine

11. Uremia--condition in which wastes normally excreted by the kidney are retained in the blood

12. Urethritis--inflammation of the urethra

F. Dialysis and transplants

1. Dialysis--treatment for patients who have defective kidney function. The blood is cleansed by passing it through an artificial filter instead of the kidney

2. Kidney transplant--replacement of a diseased kidney with a healthy kidney provided by a donor

3. Living Bank--an organization that coordinates the donation of organs

VIII. The reproductive system

A. Identification of terms

1. Circumcision--surgical removal of all or part of the foreskin of the penis
2. Embryo--early or developing state of any organism; in humans, the first weeks of uterine life
3. Fetus--latter stages in developing child in uterus from about the third month of pregnancy to birth
4. Fertilization--the union of an egg cell with a sperm cell
5. Hermaphrodite--an individual with both male and female sex organs
6. Hysterectomy--surgical removal of the uterus
7. Mastectomy--surgical removal of the breast and axillary lymph nodes, frequently done if patient has breast tumors
8. Menstruation--cyclic uterine bleeding which normally occurs at approximately four-week intervals in the absence of pregnancy. Controlled by hormones
9. Ovulation--periodic discharge of ovum from ovary
10. Papanicolaou stain--stain used in detection of cancer cells, particularly of cells from the vagina and cervix
11. Placenta--structure in the uterus through which the fetus gets its nourishment
12. Semen--secretion of reproductive organs of the male containing sperm cells and secretions from accessory reproductive glands
13. Sperm cell--male reproductive cell
14. Vasectomy--surgical procedure resulting in sterilization of males. A portion of the ductus deferens on each side is removed, thus preventing sperm cells from reaching the urethra

B. Parts of the female reproductive system

1. Ovaries--primary reproductive organ of the female, found in upper part of pelvic cavity on each side of uterus, produce ova and female hormones

2. Ovum (pl. ova)--female sex cell

3. Fallopian tube (oviduct)--duct leading from point near ovaries to the uterus. The oviducts transport ova from the body cavity to the uterus

4. Fimbriae--fringe-like extensions from anterior end of oviducts. When an ovum is released from to ovary, the fimbriae work like tentacles to draw the ovum into the uterine tube

5. Uterus--organ for containing and nourishing the embryo during pregnancy

6. Vagina--muscular tube connecting the uterus with the exterior of the body

7. Vulva--external parts of the female reproductive system

8. Perineum--pelvic floor, commonly used to mean the area between the vaginal opening and the anus

C. Parts of the male reproductive system

1. Scrotum--sac containing the testes

2. Penis--male organ of sexual intercourse

3. Testes--male reproductive glands, produce sperm cells and secrete male sex hormones

4. Epididymis--tube inside the testes in which sperm cells are collected and stored until they mature

5. Ductus deferens (vas deferens)--continuation of epididymis extending to juncture with the seminal vesicle

6. Seminal vesicles--tubes extending from the area back of the urinary bladder to the ductus deferens. Secretes mucoid substance which nourishes sperm cells

7. Prostate gland--gland surrounding the neck of the bladder and the urethra. The prostate produces fluid which helps sperm cells maintain their motility

8. Sperm cell--male reproductive cell

D. Menstrual cycle

1. Changes in female hormone secretions occur in a 28-day cycle

2. Ovulation occurs at about the middle of each 28-day period

3. Uterine wall prepares for the implantation of fertilized egg

4. If fertilization does not occur, the lining of the uterine wall sloughs off, and is expelled

5. This loss of uterine lining leaves some areas bleeding; thus,blood is also discharged from the uterine wall

6. After 4-7 days, the uterus begins to prepare for pregnancy again

7. Menstruation usually begins in females from ages 10-16 years and indicates production of ova

8. Menopause is the state at which the menstrual cycle ceases, usually occurs between the ages of 45-50

9. The menstrual cycle is controlled by hormones

E. Pregnancy

1. Fertilization normally occurs when the ovum is about one-third of the way down the fallopian tube. The fertilized egg continues the passage down the tube until it reaches the uterus

2. Six to eight days after fertilization, the zygote becomes implanted in the uterine wall

3. The placenta begins to form after implantation occurs. The placenta functions in the exchange of food, gases, and wastes between mother and baby

4. The placenta also serves as a barrier against the passage of bacteria from mother to baby. However, blood-borne diseases as syphilis and some viruses may be transmitted from mother to baby. Maternal antibodies are transmitted from mother to baby

5. The duration of pregnancy is about 280 days or 40 weeks

6. Disorders of pregnancy

    a. ectopic pregnancy--fertilized ovum is implanted at a site other than the uterus, as in a fallopian tube

    b. abortion--loss of embryo or fetus during the first 20 weeks of pregnancy

        (1) spontaneous abortion--abortion that occurs without having been induced

        (2) induced abortion--termination of pregnancy by artificial means

            (a) criminal abortion--abortions performed illegally

            (b) therapeutic abortion--abortions performed by physicians for a variety of reasons

    c. miscarriage--loss of fetus between 20 and 28 weeks of pregnancy

F. Disorders of the reproductive system

1. Amenorrhea--absence of menstrual flow

2. Cryptorchidism--failure of testes to descend into the scrotum

3. Dysmenorrhea--painful menstruation

4. Gonorrhea--infectious venereal disease caused by a bacterium; characterized by a purulent urethral discharge

5. Hermaphroditism--both male and female sex organs found in the same person. There are no known cases in which a true hermaphrodite is fertile, either as a male or female

6. False hermaphroditism--genitalia of one sex is evident; secondary sex characteristics of opposite sex predominate

7. Inguinal hernia--rupture in abdominal wall, in region of wall where testes decend from abdominal cavity into scrotum

8. Leukorrhea--vaginal discharge

9. Orchitis--inflammation of testes due to trauma, mumps, or other infection

10. Prostatism--any condition resulting in obstruction of the prostate gland, with accompanying retention of urine in the bladder

11. Salpingitis--inflammation of the fallopian tubes

12. Sterility--inability to reproduce

13. Syphilis--infectious venereal disease characterized by lesions which may involve any organ or tissue

14. Tumor--swelling or enlargement. May occur in any part of the reproductive system, occurs commonly in the breast. May be benign or malignant

IX. The endocrine glands--glands which produce hormones

A. Identification of terms

1. Endocrine gland--a gland, the secretion of which is liberated directly into the blood stream rather than by means of a duct

2. Hormone--the secretion of the ductless glands which regulates the function of other organs

3. Iodine--chemical element needed for the development and functioning of the thyroid gland

4. Lactation--the secretion of milk

5. Resorption--to dissolve and assimilate; to absorb again

6. Secondary sex characteristics--sex characteristics that are not directly concerning with reproduction, as tone of voice, facial hair, and breast development

B. Pituitary gland

1. Located at undersurface of brain

2. Hormones secreted by pituitary control the activity of other glands. Also, they affect growth, urine production, and contractions of involuntary muscles

C. Thyroid gland

1. Located just below larynx in neck

2. Helps to regulate body metabolism

D. Parathyroid glands

1. Two pairs of parathyroid glands which are embedded in the thyroid gland

2. Control the use of calcium and phosphorous by the body

E. Adrenal glands

1. One pair, located above each kidney

2. Control the release of energy to meet emergencies and use of water and salt by the body

F. Islets of Langerhans

1. Small groups of cells found in the pancreas, which secrete insulin. These cells have no digestive function

2. Insulin controls the rate of glucose metabolism and regulates blood glucose concentration

G. Sex glands--testes and ovaries

1. Teste produces hormones that regulate the development of male secondary sex

characteristics, as well as the development, maintenance, and function of reproductive organs

2. Ovaries produce hormones that regulate the development and maintenance of organs of female reproductive system, secondary sex characteristics, and pregnancy

H. Pineal gland

1. Located in cranial cavity at about the middle of the brain

2. Function in humans not definitely determined

I. Thymus gland

1. Located in chest in front of aorta and behind the sternum

2. Produces hormones that stimulate the production of lymph tissue, and small white blood cells (lymphocytes) that combat infection

J. Diseases caused by dysfunction of endocrine glands

1. Diabetes mellitus--results from a lack of insulin (Islets of Langerhans). The body is unable to use glucose without insulin. Glucose is thus excreted in the urine

2. Dwarfism--results from lack of hormone from pituitary gland. The patient is abnormally short

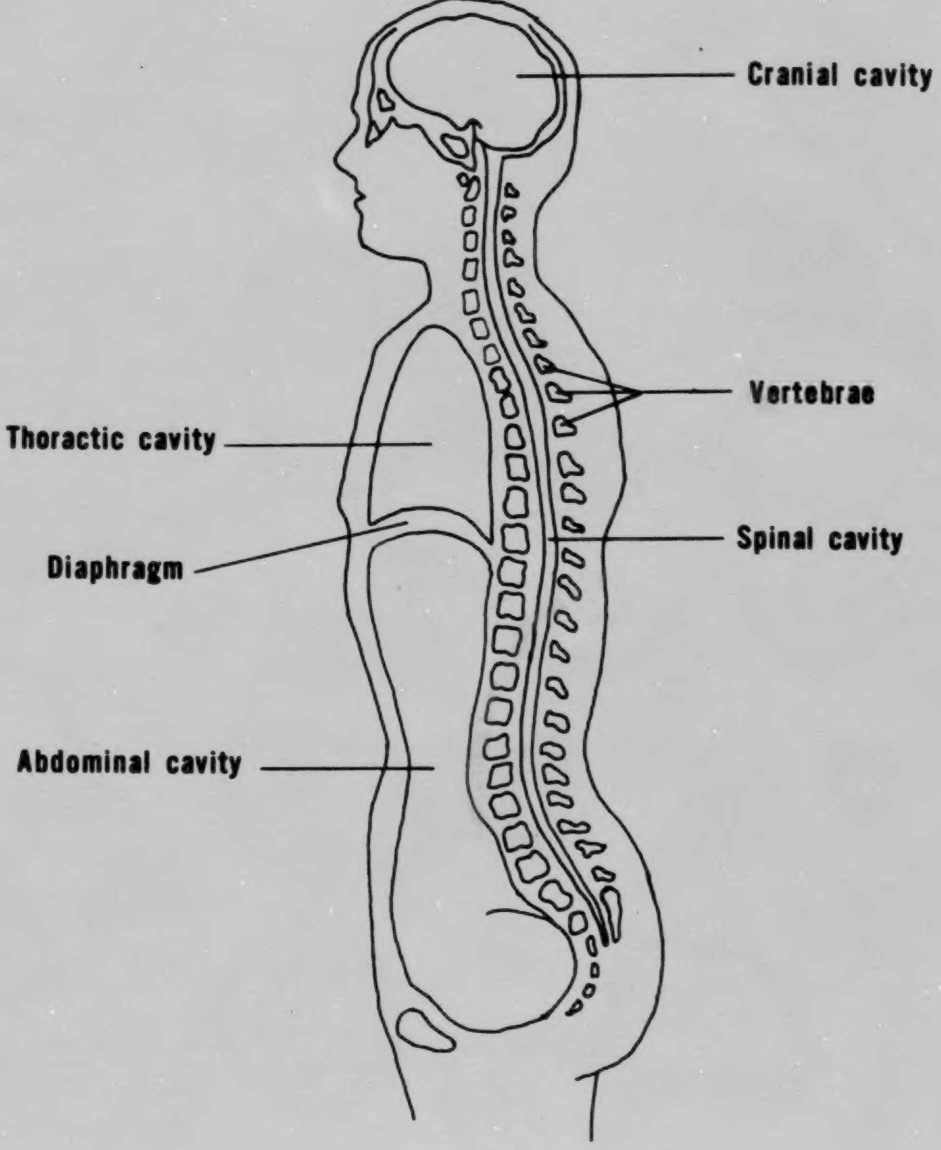
3. Giantism--results from an oversecretion of the pituitary. The patient is abnormally tall

4. Goiter--enlargement of the thyroid gland

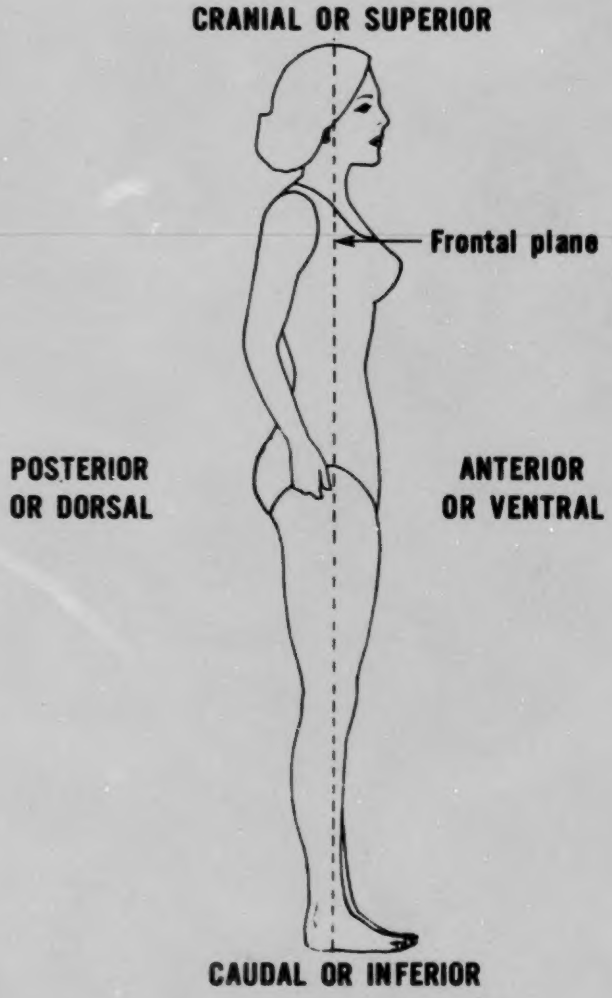
   a. simple goiter--results from a deficiency of iodine in the diet. The thyroid gland enlarges to compensate

   b. exophthalmic goiter--oversecretion of thyroxine causes bulging of the eyes, strained appearance of the face, intense nervousness, weight loss, and a rapid metabolic rate

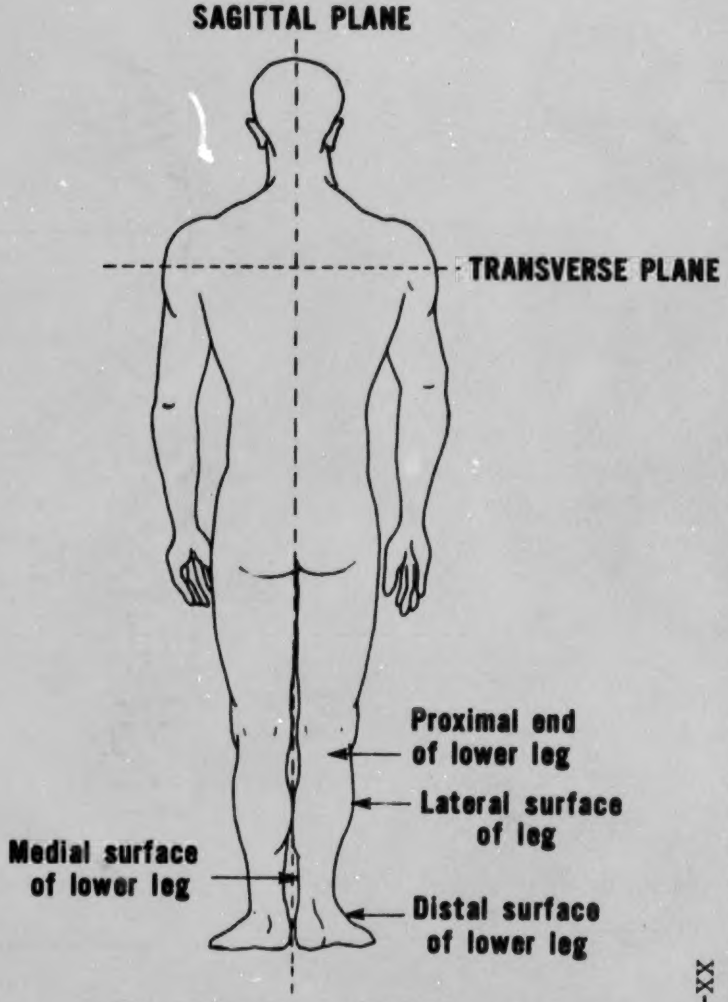
LOCATION OF BODY CAVITIES, LATERAL VIEW


Cranial cavity
Vertebrae
Thoracic cavity
Spinal cavity
Diaphragm
Abdominal cavity

HUMAN BODY


CRANIAL OR SUPERIOR
Frontal plane
POSTERIOR OR DORSAL
ANTERIOR OR VENTRAL
CAUDAL OR INFERIOR

Lateral View

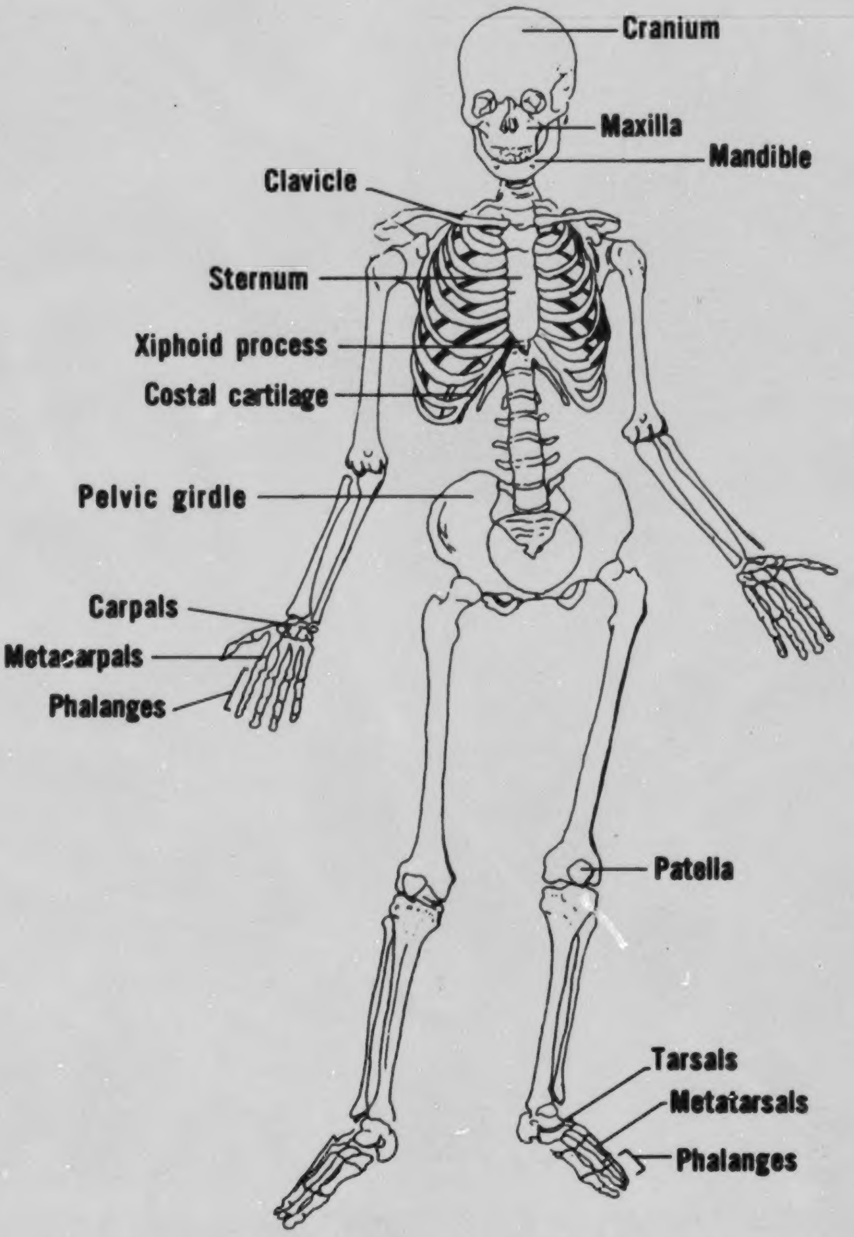

SAGITTAL PLANE
TRANSVERSE PLANE
Proximal end of lower leg
Lateral surface of leg
Medial surface of lower leg
Distal surface of lower leg

Posterior View

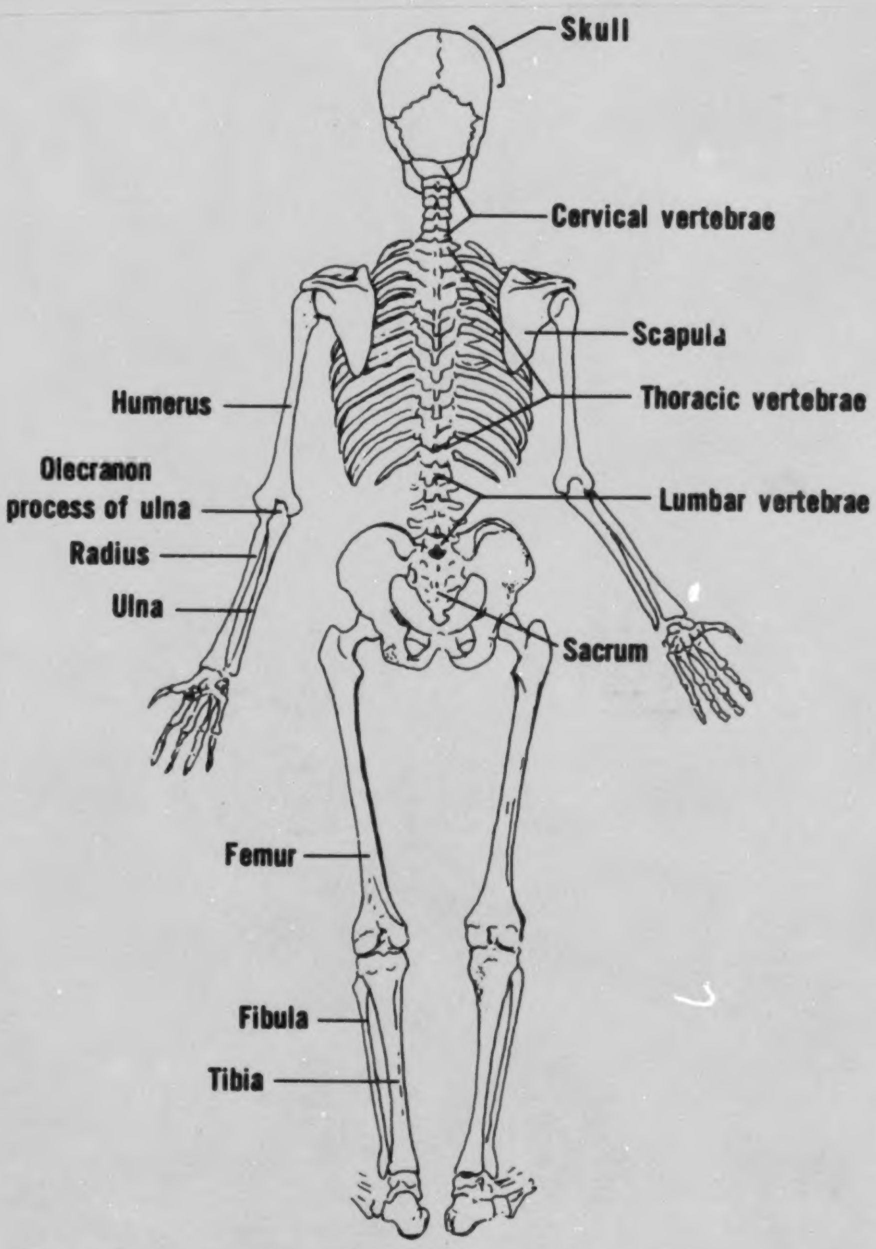
XX-TM-2

XX-39

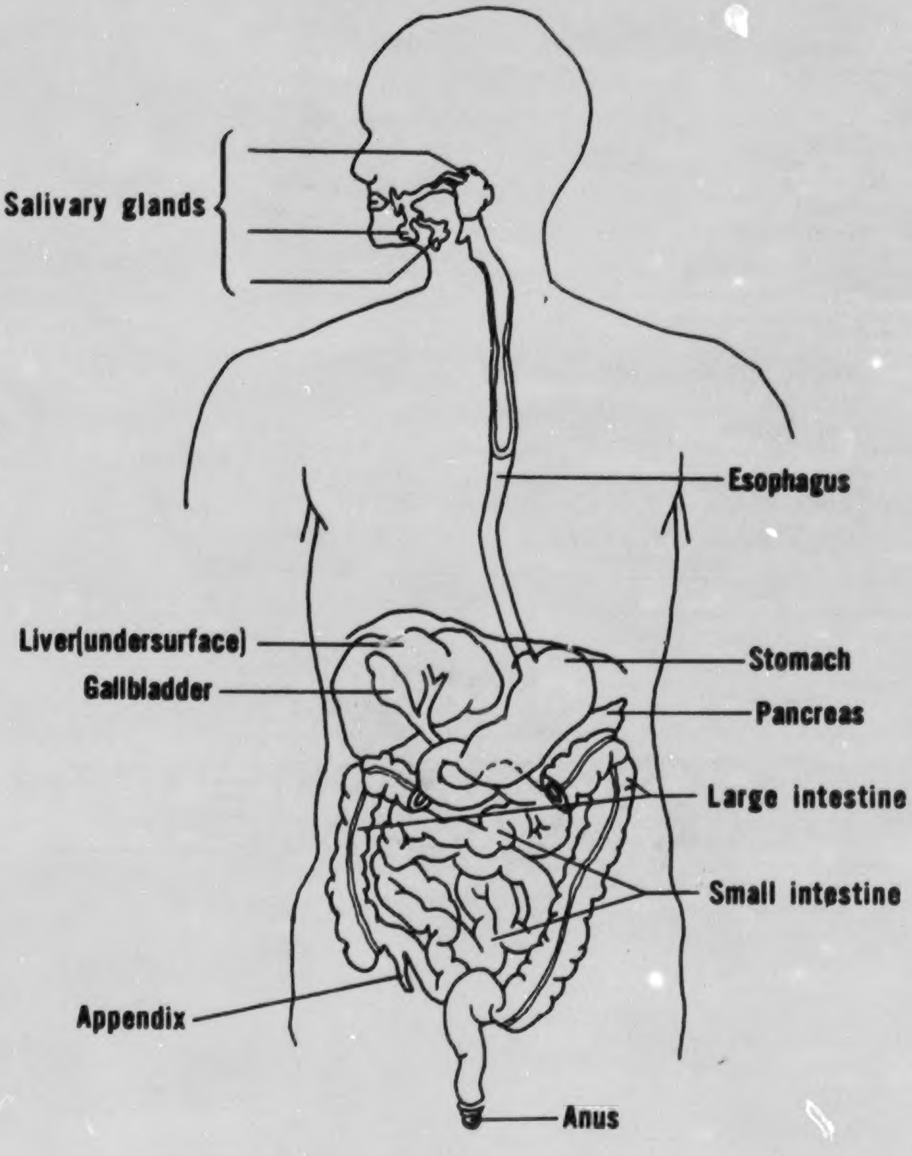
SKELETON, ANTERIOR VIEW


Cranium
Maxilla
Mandible
Clavicle
Sternum
Xiphoid process
Costal cartilage
Pelvic girdle
Carpals
Metacarpals
Phalanges
Patella
Tarsals
Metatarsals
Phalanges

SKELETON, POSTERIOR VIEW


Skull
Cervical vertebrae
Scapula
Thoracic vertebrae
Humerus
Olecranon process of ulna
Lumbar vertebrae
Radius
Ulna
Sacrum
Femur
Fibula
Tibia

PARTS OF THE DIGESTIVE SYSTEM


Salivary glands
Esophagus
Liver(undersurface)
Stomach
Gallbladder
Pancreas
Large intestine
Small intestine
Appendix
Anus

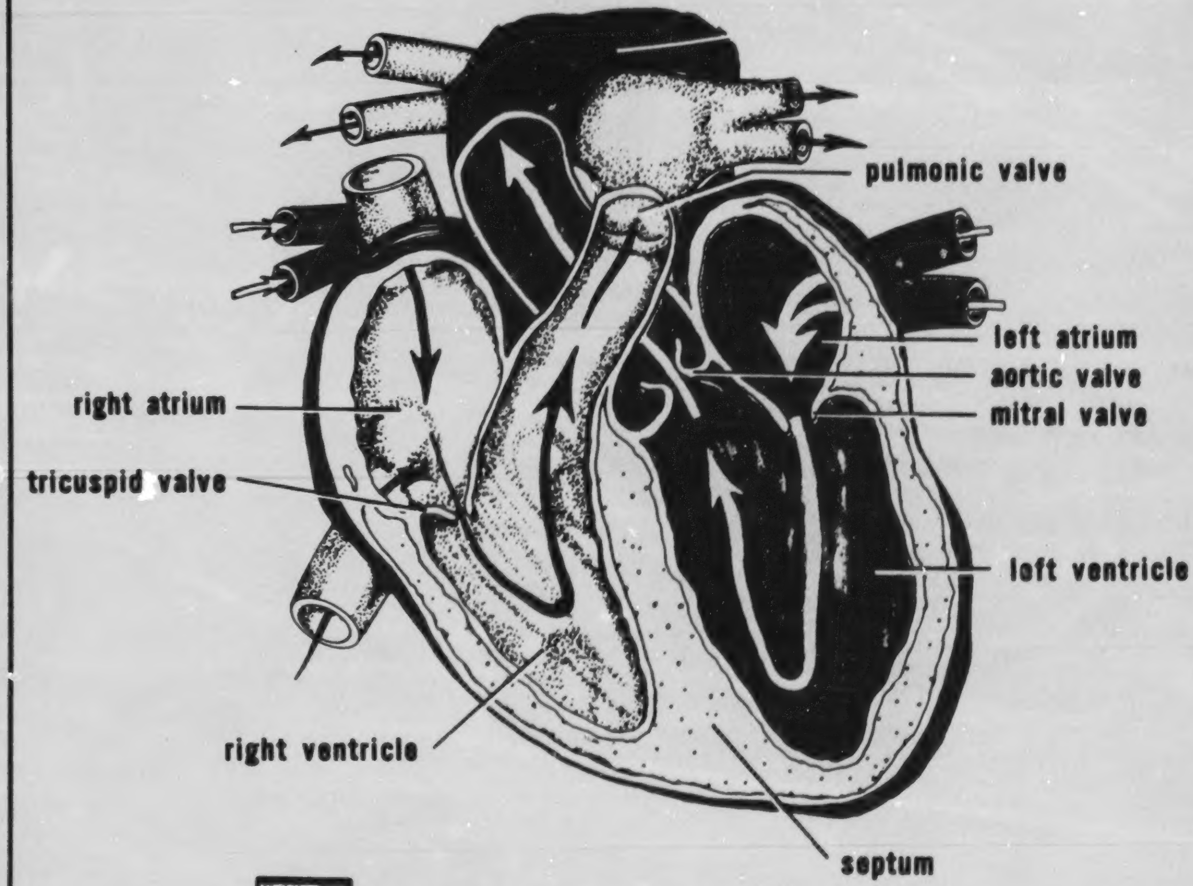
DIGESTIVE JUICES AND ENZYMES

Digestive juices and enzymes	Source	Place of Action	Action of enzyme or digestive juice
Saliva	Salivary glands	Mouth	
Ptyalin			Begins starch digestion
Gastric juice	Stomach	Stomach	
Pepsin			Begins protein digestion
Lipase			Emulsifies fats
Rennin (children)			Curdles milk
Hydrochloric acid			Softens connective tissue in meat Kills some pathogenic bacteria Activates gastric enzymes
Pancreatic juice	Pancreas	Small intestine	
Trypsin			Acts on protein
Amylopsin			Acts on starch
Lipase			Acts on fats
Intestinal juice	Small intestine	Small intestine	
Enterokinase			Acts on protein
Sucrase			Changes sucrose to simple sugar
Lactase			Changes lactose to simple sugar
Maltase			Changes maltose to simple sugar
Bile	Liver	Small intestine	Emulsifies fats

XX-TM-6

XX-47

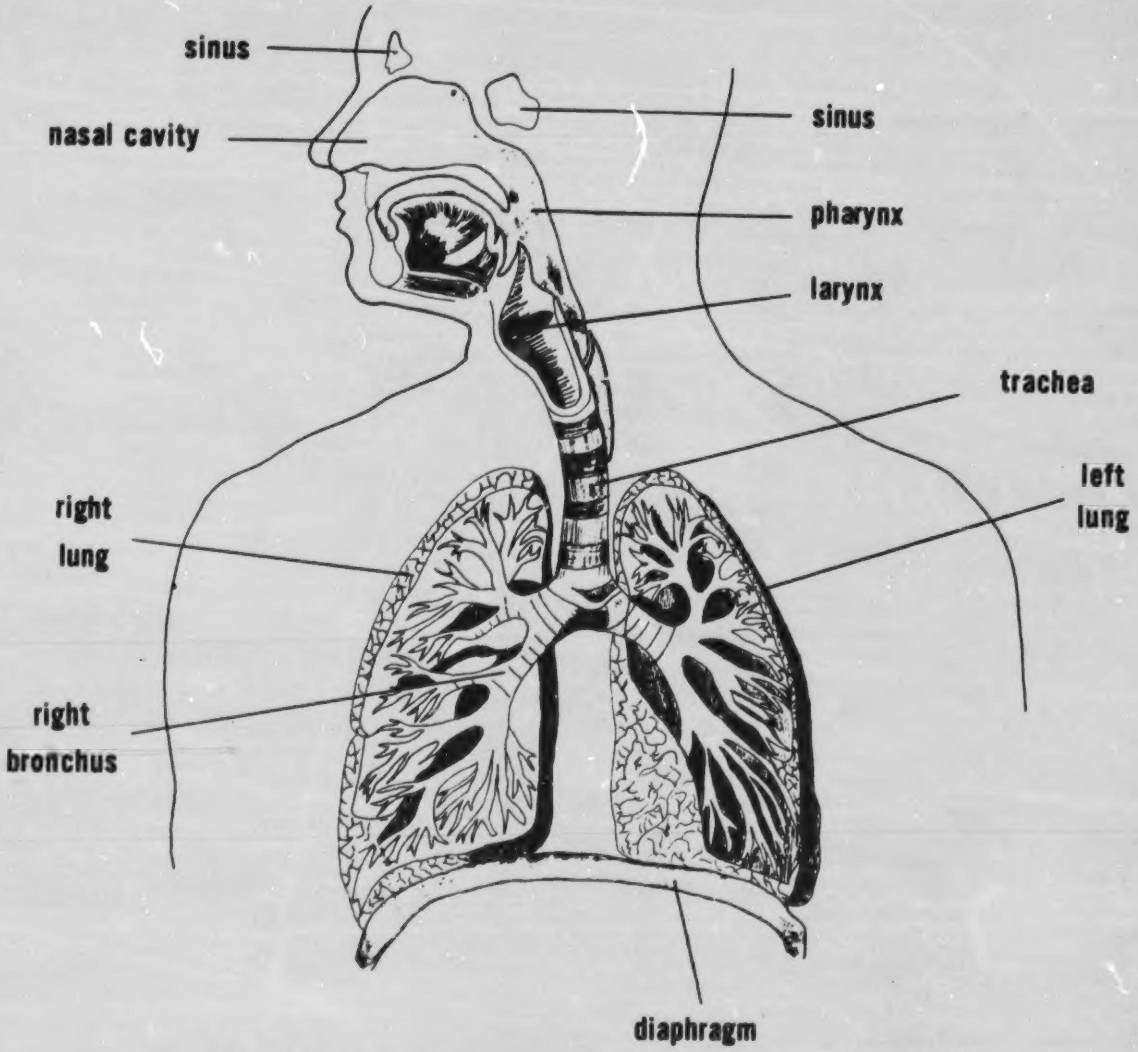
THE HEART


pulmonic valve
left atrium
aortic valve
mitral valve
right atrium
tricuspid valve
left ventricle
right ventricle
septum

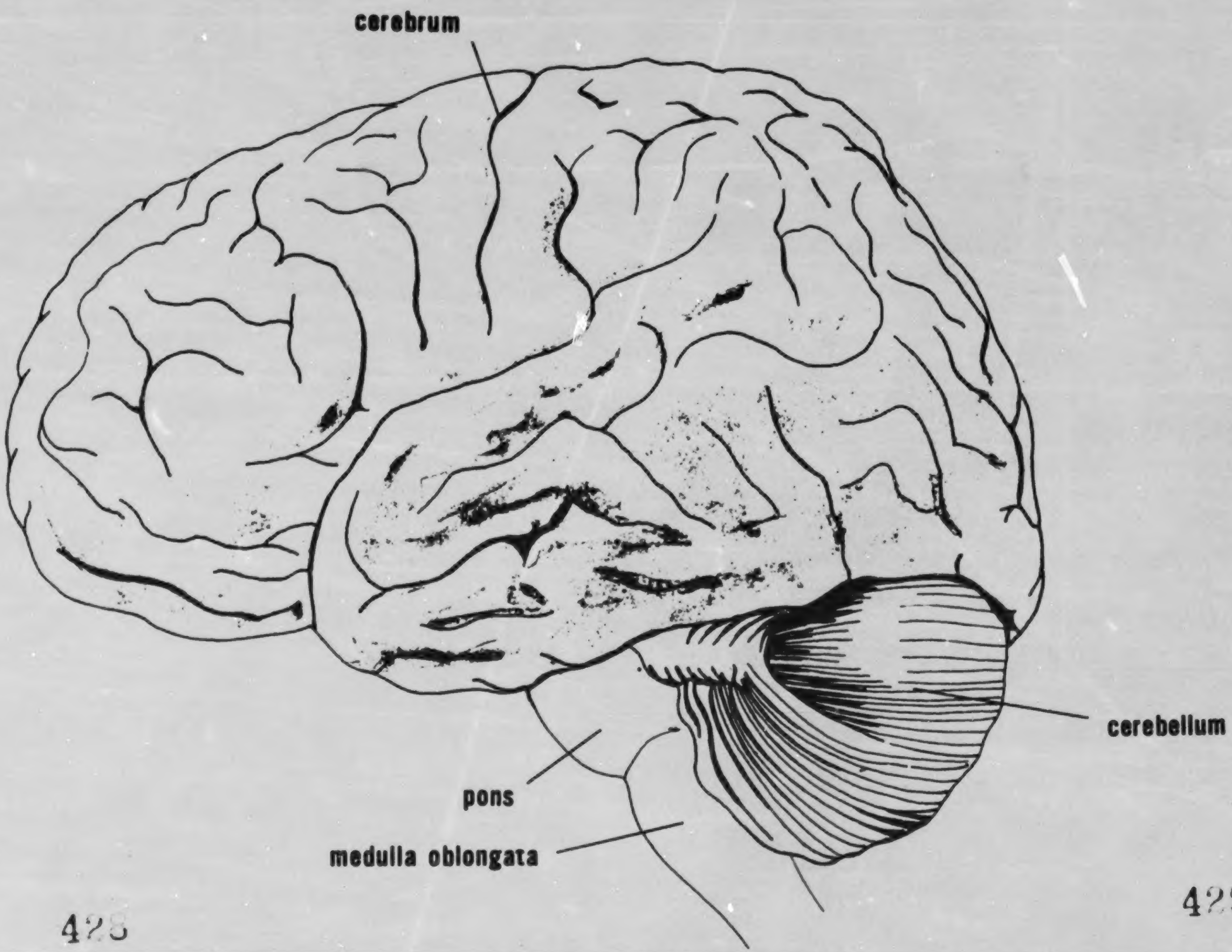
☐ Blood low in oxygen (venous)

■ Blood high in oxygen (arterial)

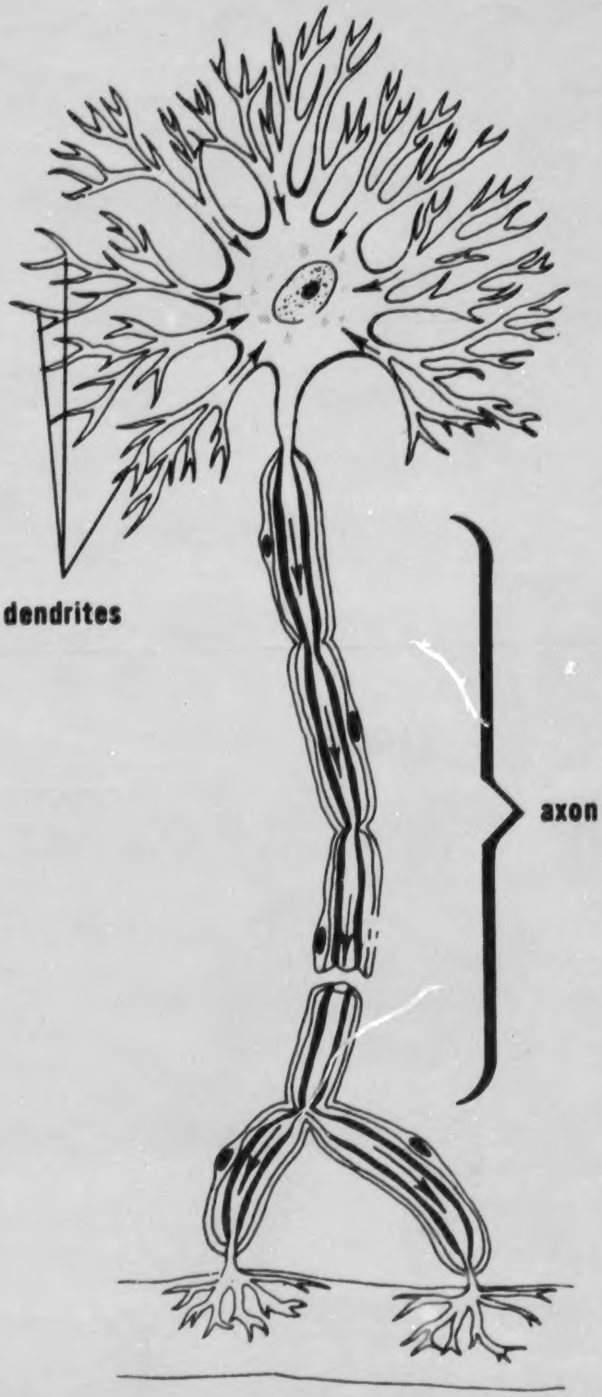
PARTS OF THE RESPIRATORY SYSTEM


sinus
nasal cavity
sinus
pharynx
larynx
trachea
right lung
left lung
right bronchus
diaphragm

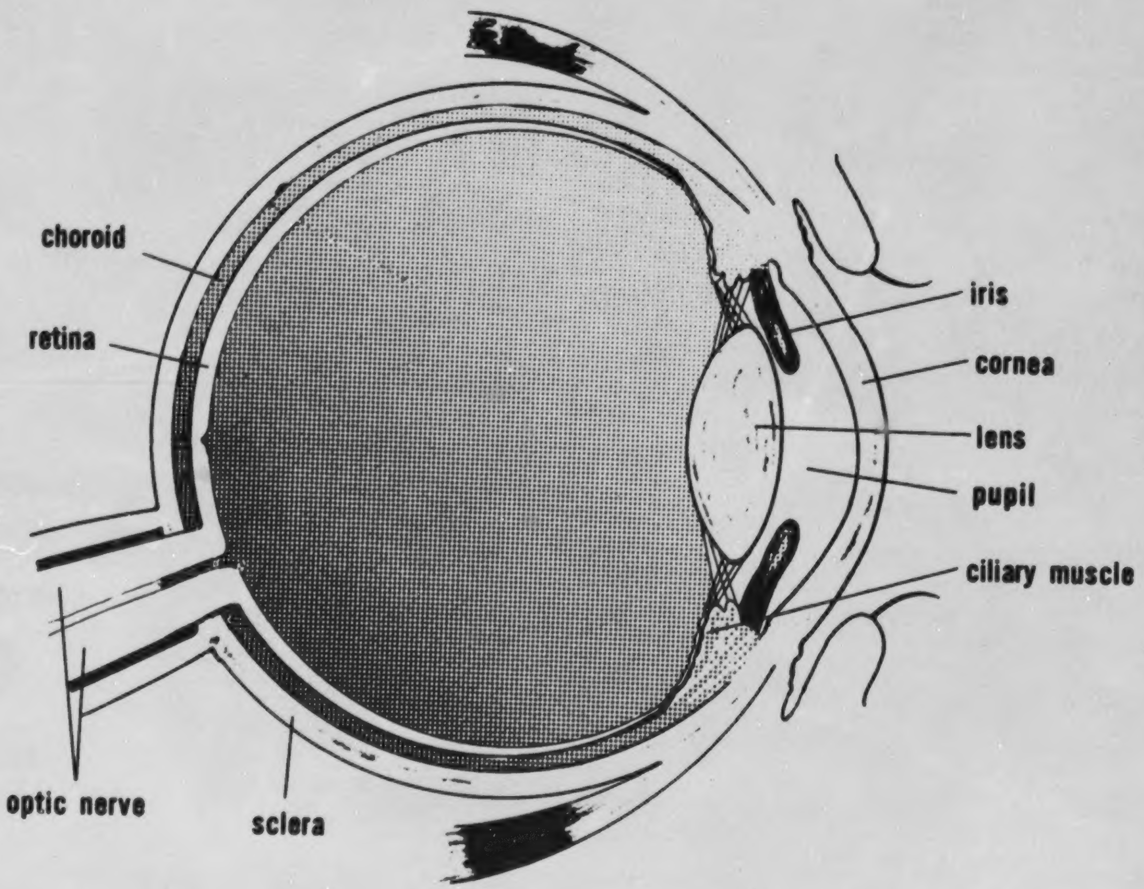
PARTS OF THE BRAIN


cerebrum
cerebellum
pons
medulla oblongata

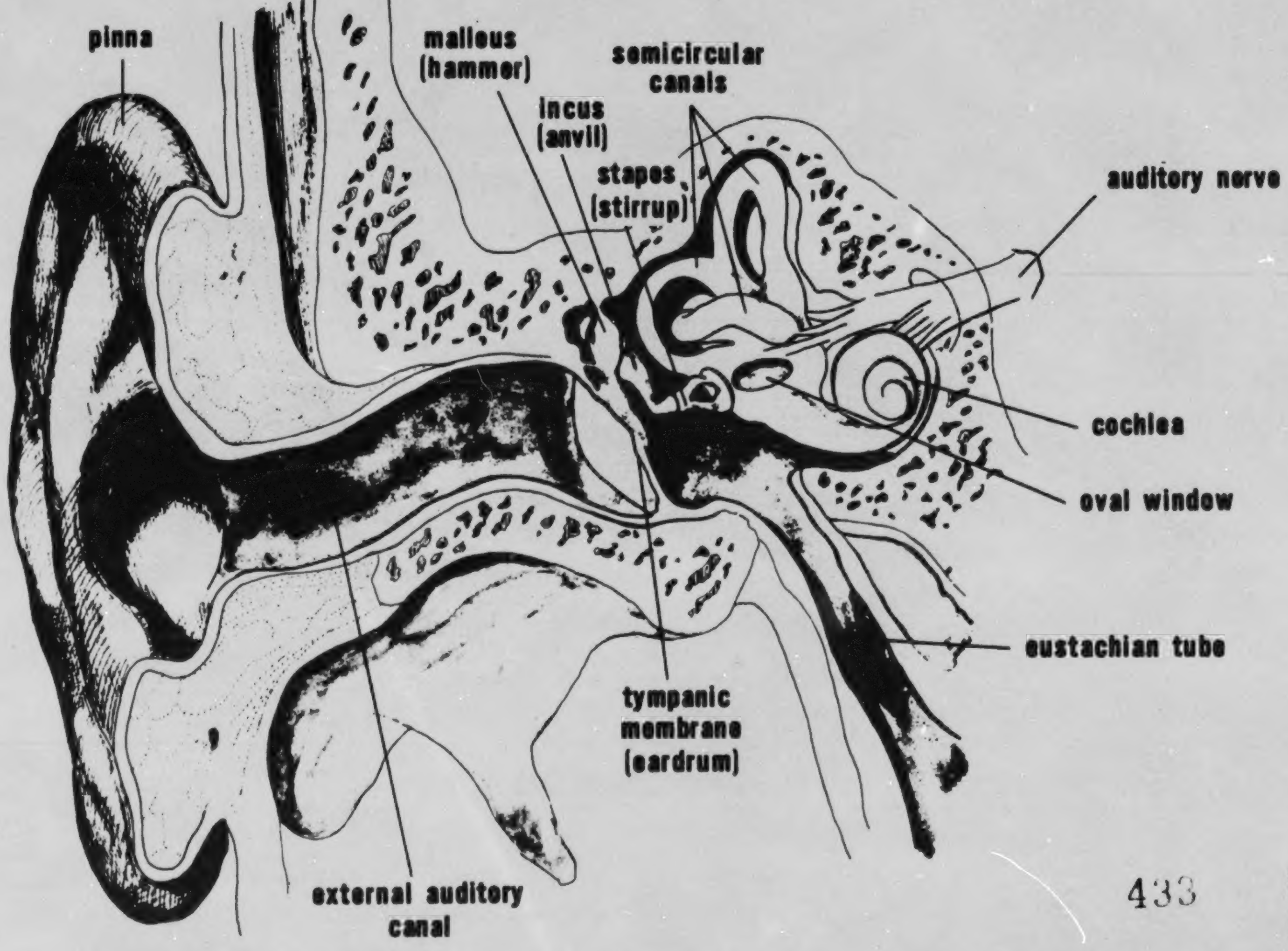
MOTOR NEURON


dendrites
axon

PARTS OF THE EYE


choroid
retina
optic nerve
sclera
iris
cornea
lens
pupil
ciliary muscle

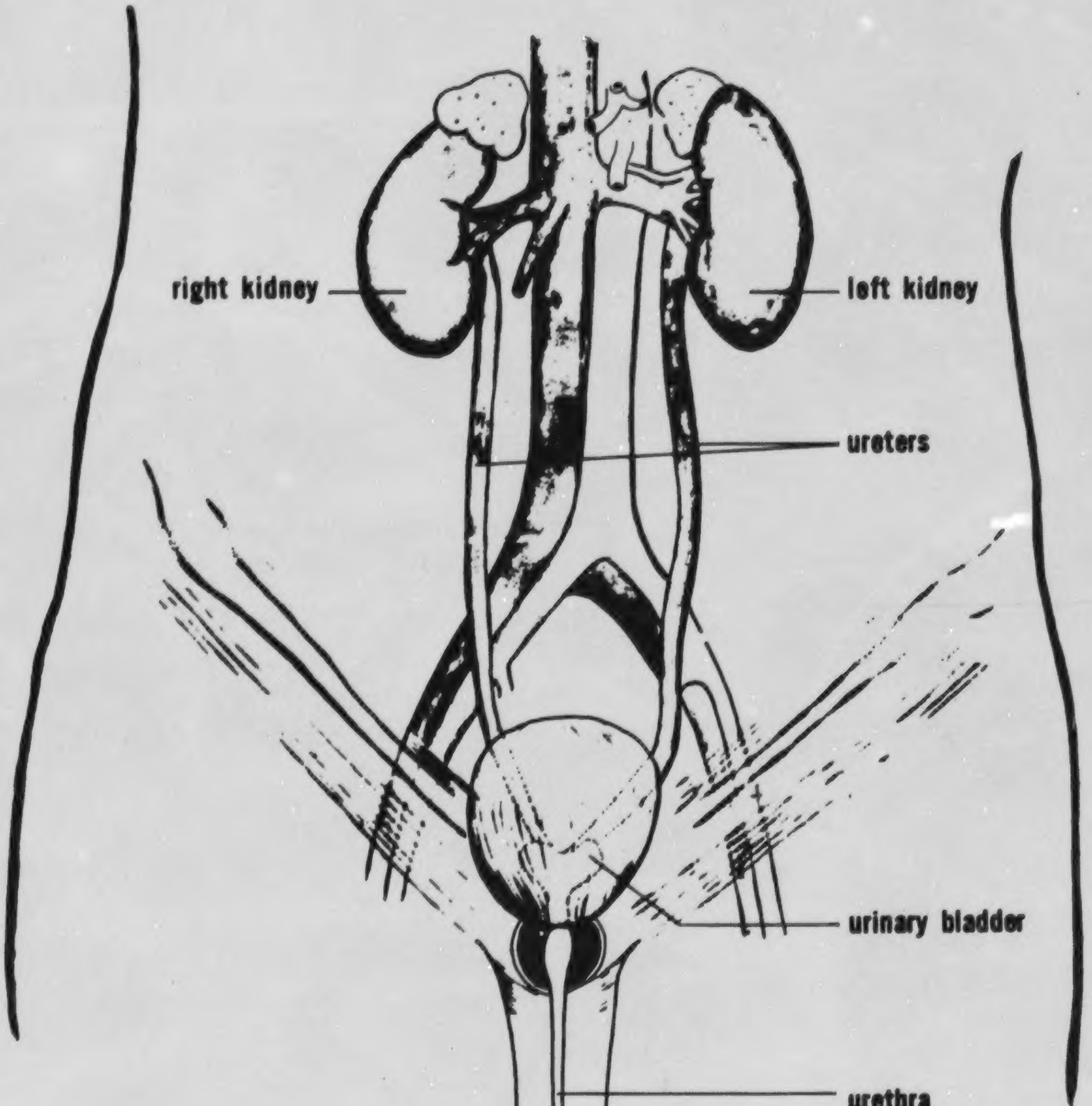
PARTS OF THE EAR


pinna
malleus (hammer)
incus (anvil)
stapes (stirrup)
semicircular canals
auditory nerve
cochlea
oval window
eustachian tube
tympanic membrane (eardrum)
external auditory canal

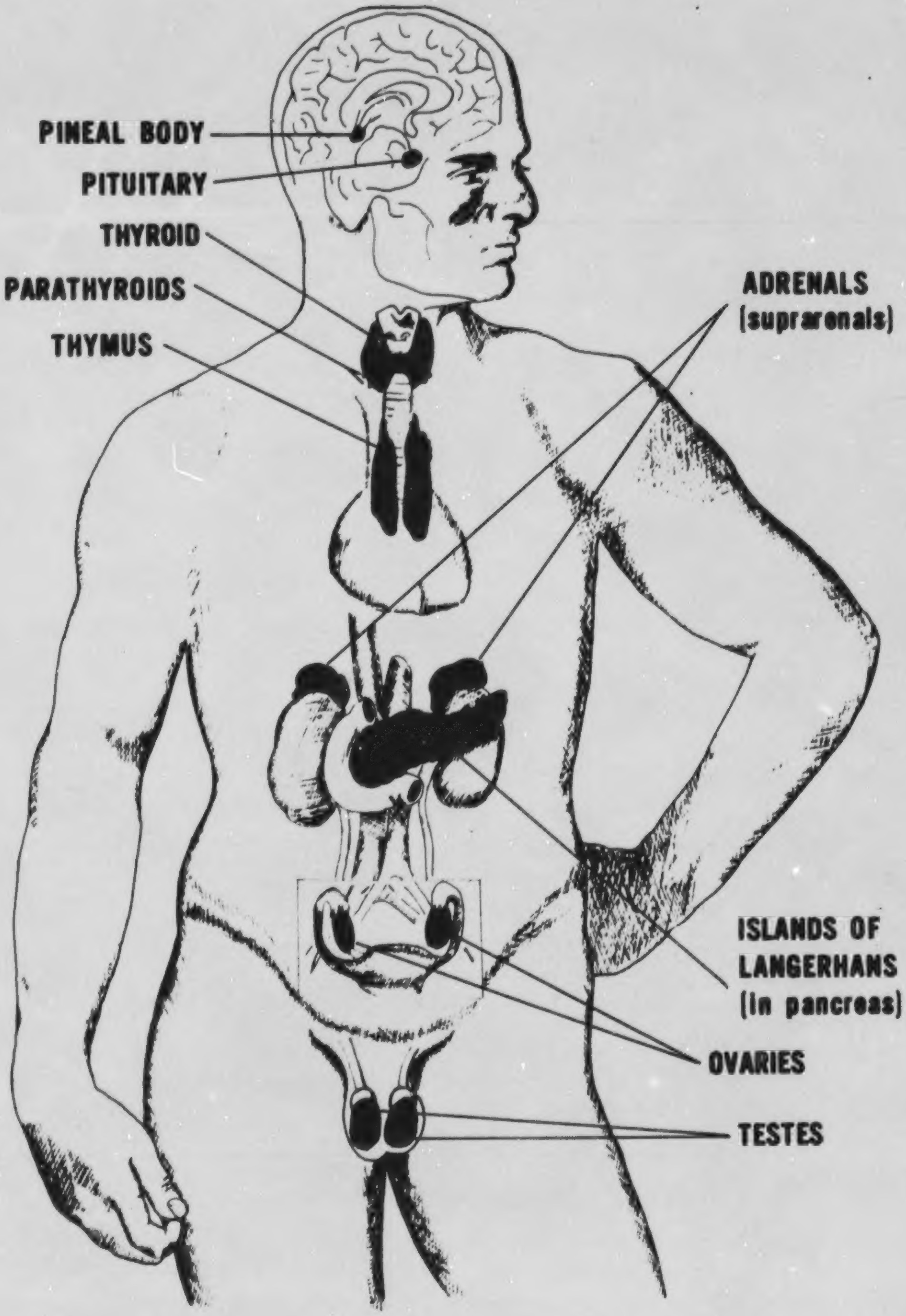
XX-TM-12

XX-59

THE URINARY SYSTEM


right kidney
left kidney
ureters
urinary bladder
urethra

ENDOCRINE GLANDS


PINEAL BODY
PITUITARY
THYROID
PARATHYROIDS
THYMUS
ADRENALS
(suprarenals)
ISLANDS OF
LANGERHANS
(in pancreas)
OVARIES
TESTES

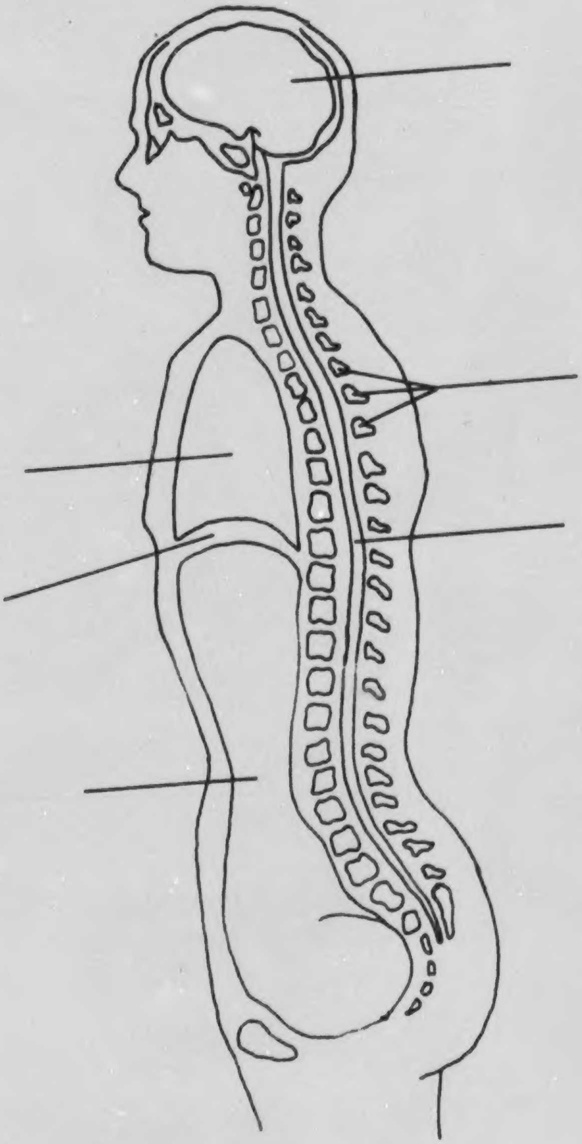
UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #1--LABEL DIAGRAM OF BODY CAVITIES

Directions: Label the indicated parts of the diagram using the following terms.

cranial cavity
vertebrae
spinal cavity
thoracic cavity
diaphragm
abdominal cavity



UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #2--LABEL DIAGRAMS OF HUMAN BODY, LATERAL AND POSTERIOR VIEWS

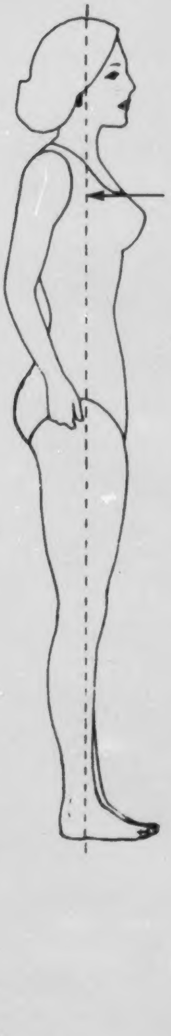
Directions: Label the indicated parts of the diagrams using the following terms.

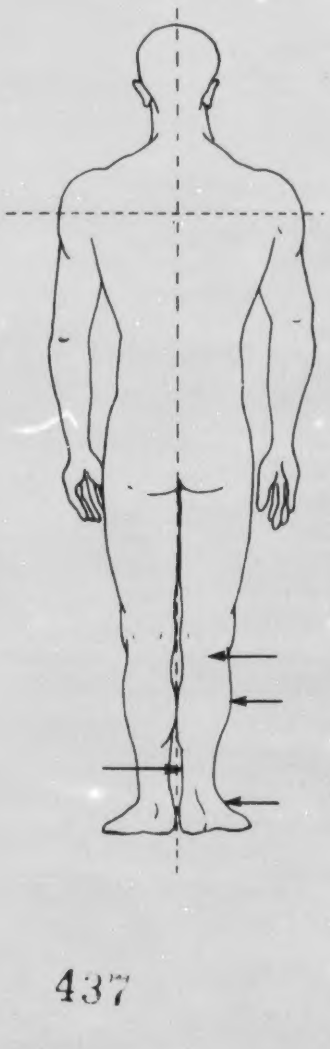
Lateral View

cranial or superior
frontal plane
posterior or dorsal
anterior or ventral
caudal or inferior

Posterior View

sagittal plane
proximal end of lower leg
lateral surface of leg
medial surface of leg
distal end of lower leg





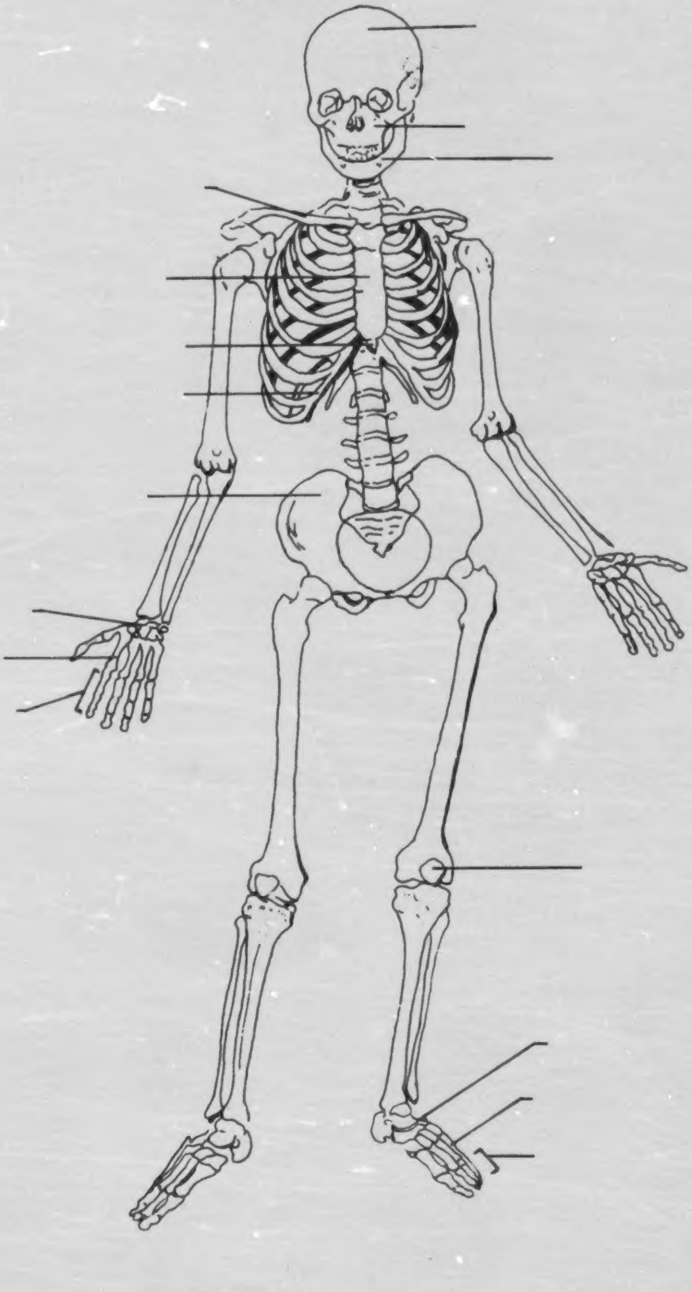
UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #3--LABEL DIAGRAM OF SKELETON-- ANTERIOR VIEW

Directions: Using the following terms, label the diagram "Skeleton, Anterior View".

1. cranium
2. maxilla
3. mandible
4. clavicle
5. sternum
6. xiphoid process
7. costal cartilage
8. pelvic girdle
9. carpals
10. metacarpals
11. phalanges
12. patella
13. tarsals
14. metatarsals
15. phalanges



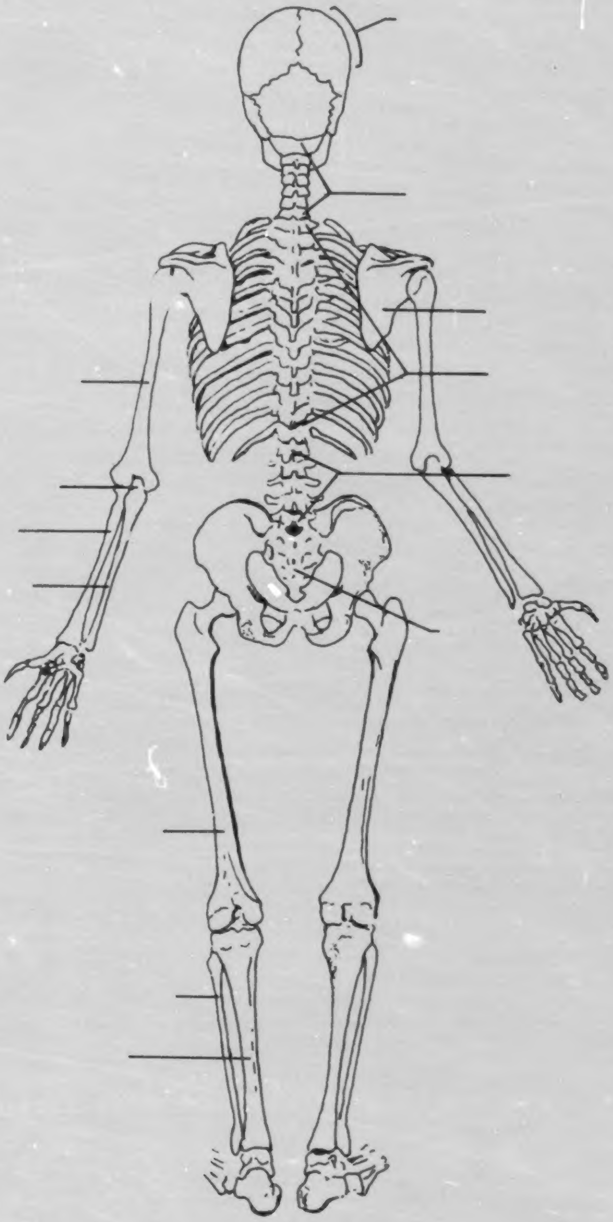
UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #4--LABEL DIAGRAM OF SKELETON, POSTERIOR VIEW

Directions: Using the following terms, label the diagram "Skeleton, Posterior View".

1. skull
2. cervical vertebrae
3. thoracic vertebrae
4. lumbar vertebrae
5. sacrum
6. humerus
7. olecranon process of ulna
8. raduis
9. ulna
10. femur
11. fibula
12. tibia
13. scapula



UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #5--QUESTIONS ABOUT THE SKELETAL AND MUSCULAR SYSTEMS

Directions: Answer the following questions.

1. List four functions of the skeletal system.

   a.

   b.

   c.

   d.

2. List and describe three types of fractures.

   a.

   b.

   c.

3. List and describe five diseases or disorders of bone.

   a.

   b.

   c.

   d.

   e.

4. List three types of muscles.

   a.

   b.

   c.

5. List and describe five muscle disorders.

   a.

   b.

   c.

   d.

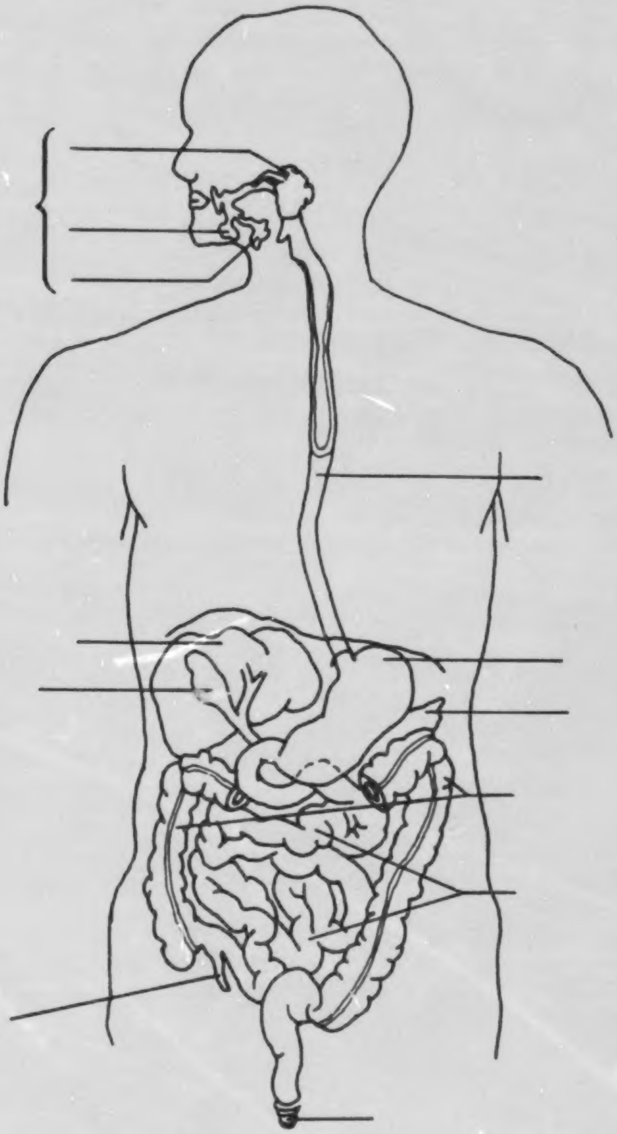
   e.

UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #6--LABEL PARTS OF THE DIGESTIVE SYSTEM

Directions: Label the indicated parts of the diagram of the digestive system.



UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #7--IDENTIFY ENZYMES AND THEIR ACTION

Place the name of the enzyme that acts on each of the foods listed in the blank spaces provided. Use the enzymes listed below for your answers.

amylopsin
enterokinase
lactase
lipase
maltase
pepsin
ptyalin
rennin
sucrase

	ENZYME	SOURCE	ACTION
1.	________________	gastric juice	protein digestion
2.	________________	gastric juice	emulsifies fats
3.	________________	intestinal juice	acts on protein
4.	________________	saliva	begins starch digestion
5.	________________	pancreatic juice	acts on starch
6.	________________	intestinal juice	changes sucrose to simple sugar
7.	________________	gastric juice	curdles milk
8.	________________	intestinal juice	changes maltose to simple sugar
9.	________________	intestinal juice	changes lactose to simple sugar

UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #8--WORD FIND PUZZLE--DIGESTIVE SYSTEM

Directions: The following terms which are disorders of the digestive system can be found in the puzzle. They may be written forward, backward, vertically, horizontally, or diagonally. Circle each term as you find it.

appendicitis
cancer
cholecystitis
cholelithiasis
cirrhosis
dental caries
diabetes
diarrhea
dysentery
flatulence
gingivitis
heartburn
hepatitis
mumps
pyorrhea
stomatitis
ulcer
vomiting

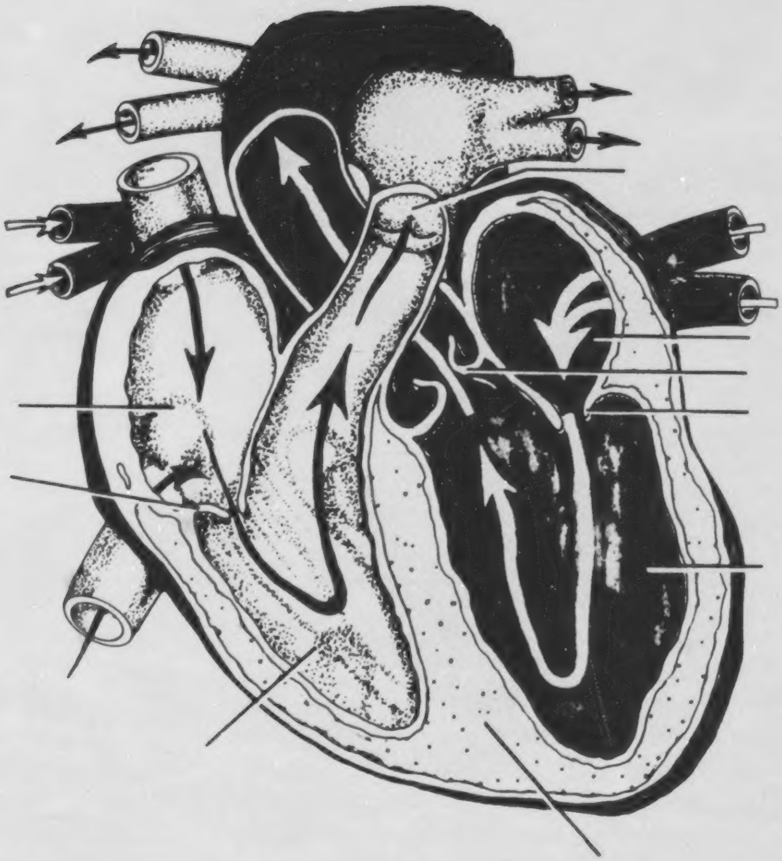
D	P	Y	O	R	R	H	E	A	A	X	T	S	O	P	F
E	A	O	I	C	U	E	S	P	M	U	M	T	U	L	R
N	D	O	M	I	J	A	I	F	D	E	D	A	A	C	I
T	Y	O	E	R	T	R	A	B	I	Q	R	T	U	S	E
A	S	N	R	R	Y	T	O	L	A	P	U	S	G	O	N
L	E	Y	T	H	T	B	N	K	B	L	S	W	I	L	D
C	N	C	E	O	I	U	J	L	E	G	I	R	N	E	L
A	T	N	S	S	R	R	O	N	T	N	T	M	G	C	Y
R	E	Y	T	I	O	N	C	U	E	I	I	O	I	Y	P
I	R	O	Y	S	N	E	O	T	S	T	C	E	V	S	E
E	Y	L	G	C	Y	D	N	R	T	I	I	N	I	T	O
S	T	O	M	A	T	I	T	I	S	M	D	O	T	I	P
O	E	R	O	N	E	C	R	B	J	O	N	I	I	T	L
B	C	B	D	C	R	E	C	L	U	V	E	A	S	I	E
A	T	F	X	E	S	I	T	I	T	A	P	E	H	S	T
D	I	A	R	R	H	E	A	N	Y	Z	P	B	C	R	O
O	C	H	O	L	E	L	I	T	H	I	A	S	I	S	O

UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #9--DIAGRAM OF HEART

Directions: Label the parts of the diagram of the heart.



UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #10--SCRAMBLED LETTER PUZZLE

Directions: Unscramble the letters below to form the names of disorders of the circulatory system which are defined below.

1. ysmeuran _ _ _ _ _ _ _ _
2. starreiclosieosr _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
3. sidendarcoti _ _ _ _ _ _ _ _ _ _ _ _
4. engregan _ _ _ _ _ _ _ _
5. subrtomh _ _ _ _ _ _ _ _
6. biplheist _ _ _ _ _ _ _ _ _
7. rmuumr _ _ _ _ _ _
8. chismaie _ _ _ _ _ _ _ _
9. ghoremrhae _ _ _ _ _ _ _ _ _ _
10. tnpesniorhye _ _ _ _ _ _ _ _ _ _ _ _

1. abnormal dilatation of a blood vessel
2. thickening, hardening, and loss of elasticity of blood vessels, especially arteries
3. inflammation of the lining of the heart
4. death of tissue due to lack of blood supply, usually accompanied by bacterial invasion
5. a blood clot
6. inflammation of a vein
7. abnormal heart sound
8. insufficient blood supply to a given part of the body
9. copius bleeding
10. high blood pressure

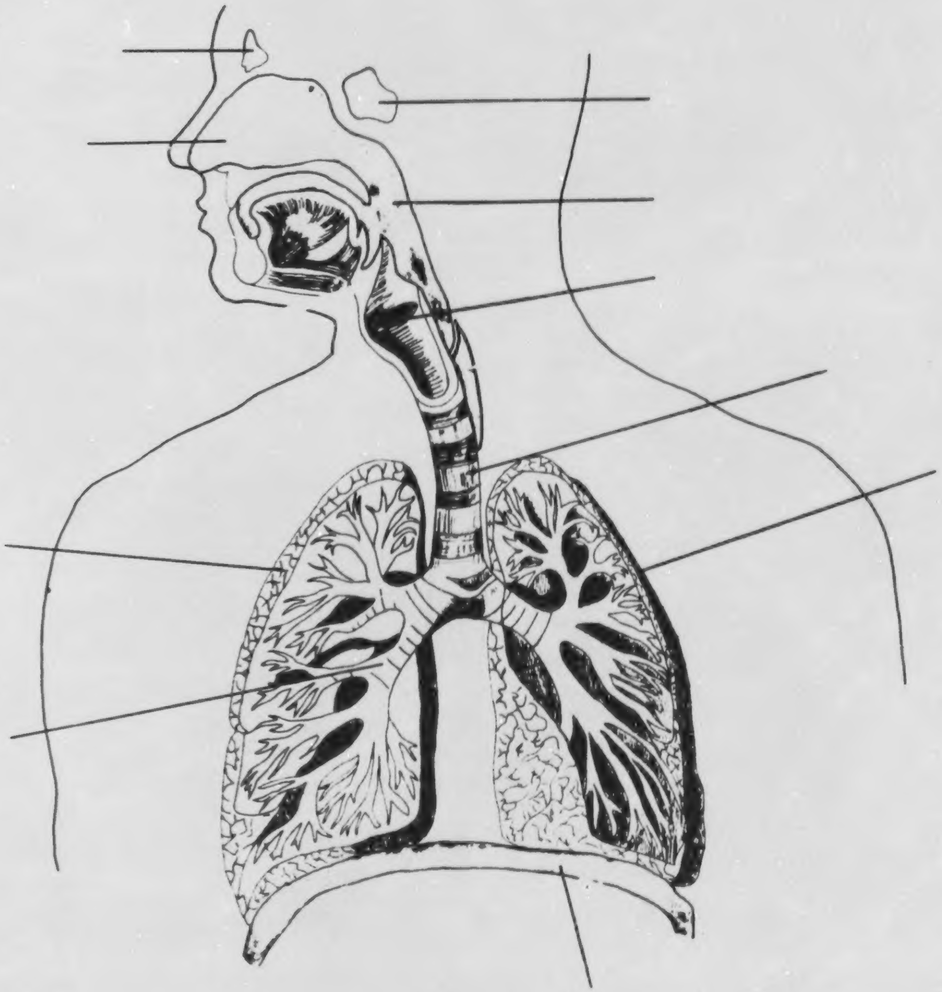
UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #11--DIAGRAM OF PARTS OF RESPIRATORY SYSTEM

Directions: Label the following parts of the respiratory system.

sinus
pharynx
nasal cavity
epiglottis
larynx
esophagus
trachea
left lung
right lung
right bronchus
diaphragm



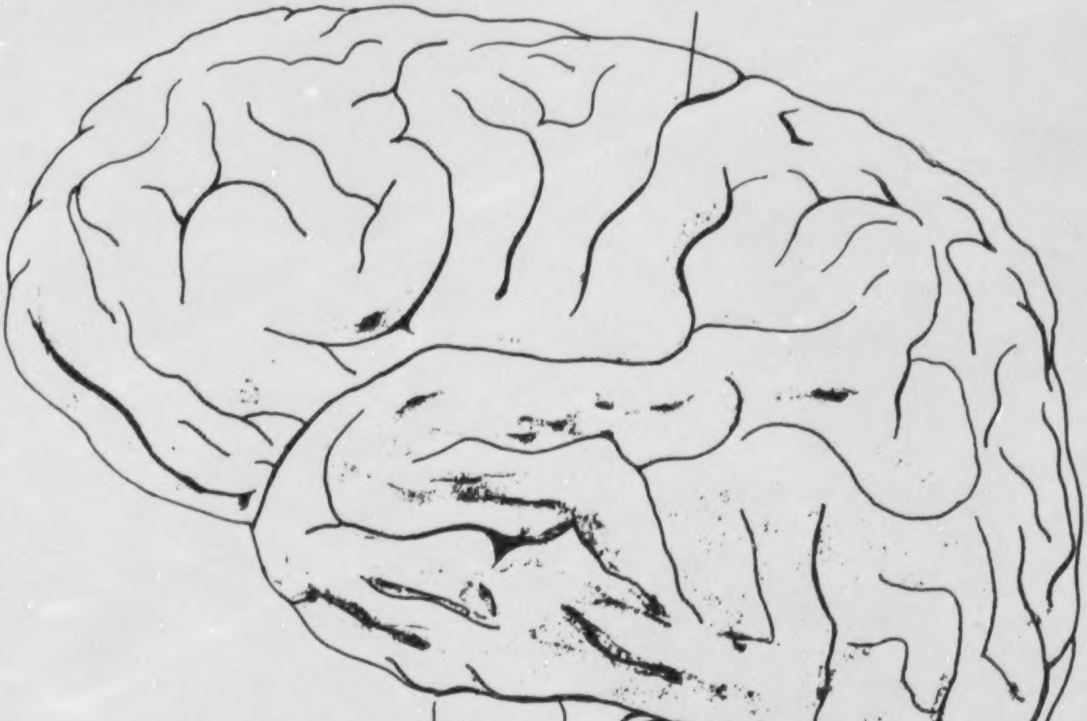
UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #12--DIAGRAM OF THE BRAIN

Directions: Label the following parts of the brain.

- cerebrum
- cerebellum
- pons
- medulla oblongata
- spinal cord



UNIT XX

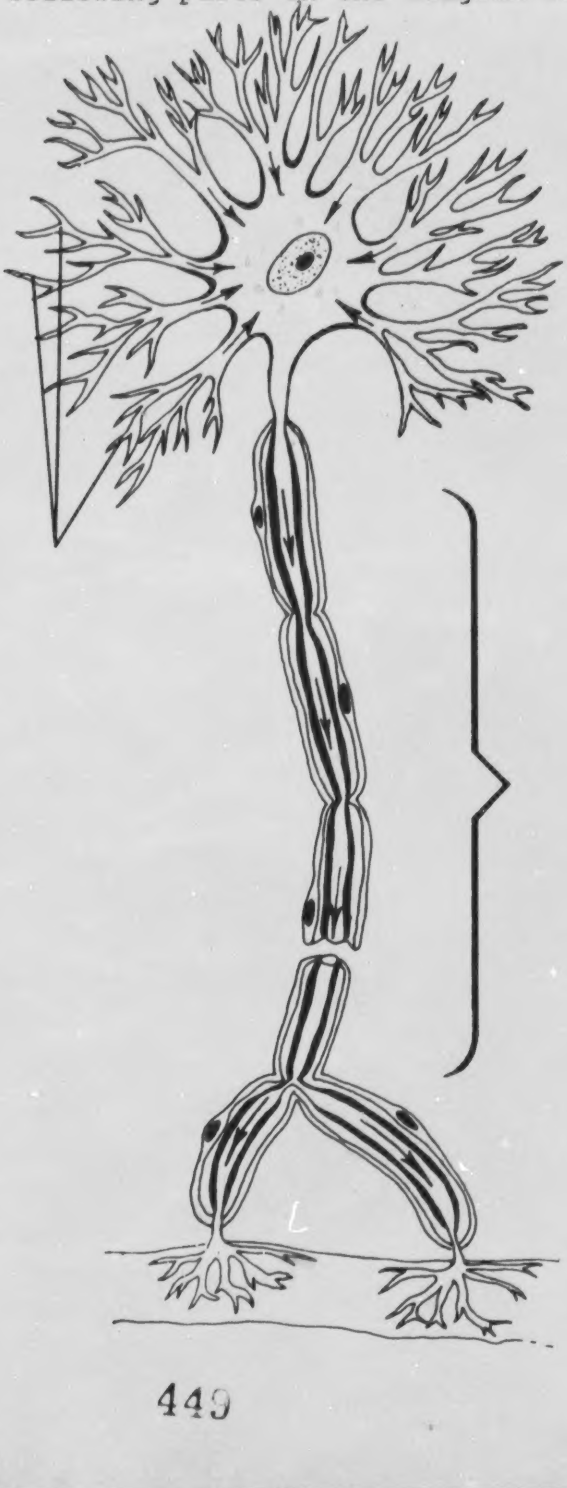
ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #13--DIAGRAM OF A NEURON

Directions: Label the following parts on the diagram of a neuron.

dendrites

axon



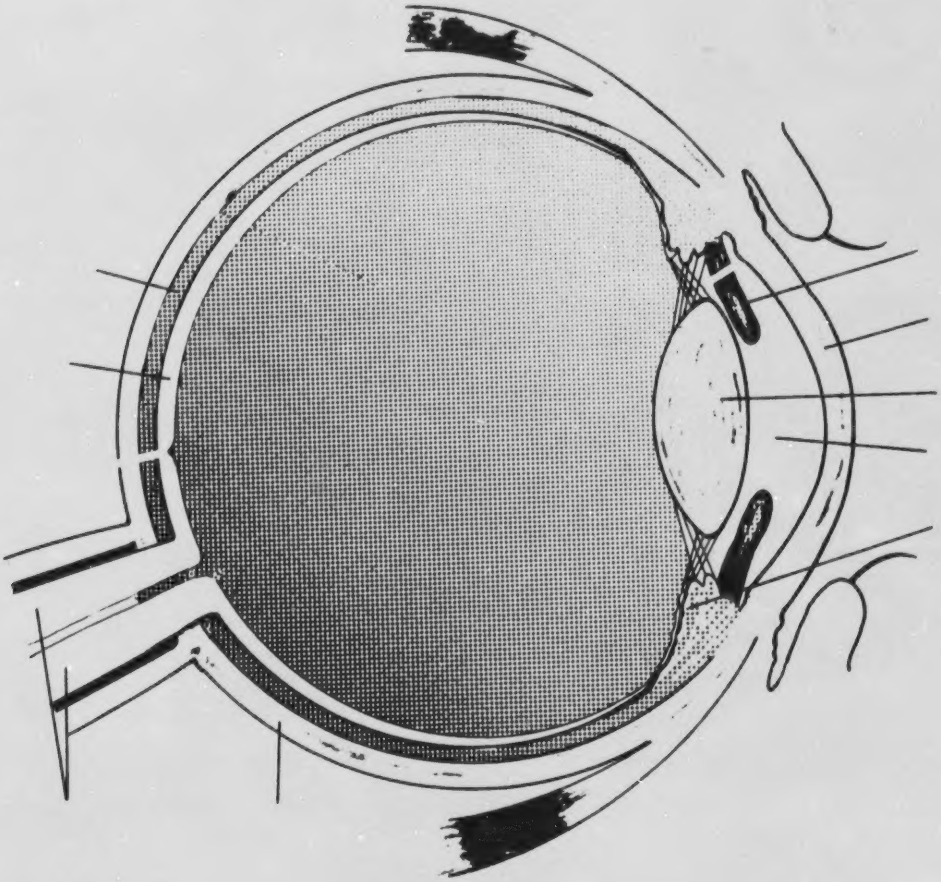
UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #14--DIAGRAM OF THE EYE

Directions: Label the following parts of the diagram of the eye.

- optic nerve
- retina
- choroid
- sclera
- pupil
- iris
- cornea
- lens
- ciliary body



UNIT XX

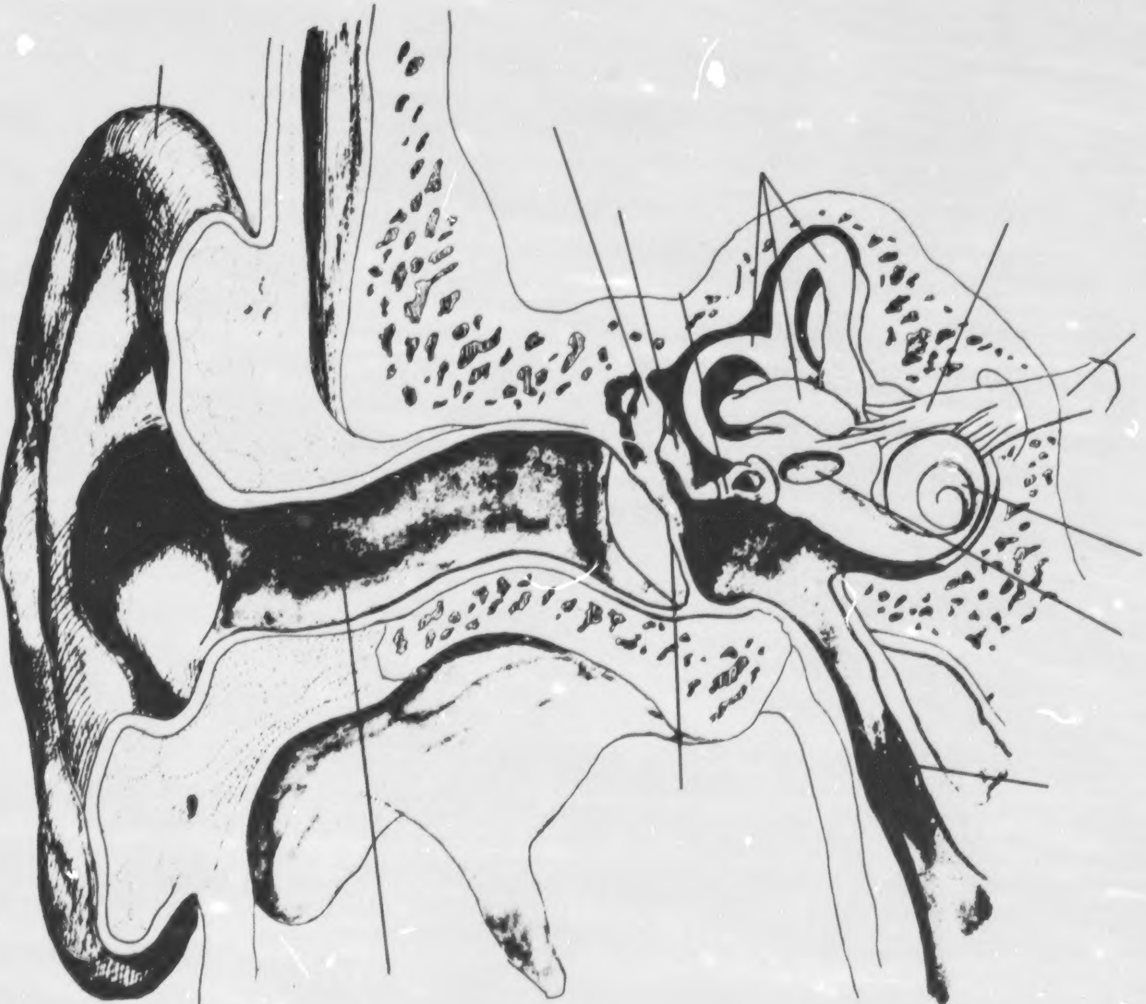
ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #15--DIAGRAM OF EAR

Directions: Label the following parts of the diagram of the ear.

pinna
auditory canal
tympanic membrane
eustachian tube
malleus

incus
stapes
oval window
cochlea
semicircular canals
auditory nerve



UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #16--WORD FIND PUZZLE

Directions: The following terms, which are disorders of the nervous system and special senses, can be found in the puzzle. They may be written forward, backward, vertically, horzontally, or diagonally. Circle each term as you find it.

astigmatism
cerebral palsy
C.V.A.
encephalitis
epilepsy
glaucoma
hydrocephalus
hyperopia
meningitis
multiple sclerosis
myopia
neuralgia
otitis media
paralysis
poliomyelitis
strabismus

M	U	L	T	I	P	L	E	S	C	L	E	R	O	S	I	S	K	H
S	C	O	C	O	N	J	U	N	C	T	I	V	I	T	I	S	P	Y
I	T	A	L	A	I	P	O	Y	M	N	O	N	S	Y	U	E	O	P
T	V	I	S	V	W	X	O	E	P	Q	S	E	U	A	S	N	L	E
A	B	D	E	C	B	O	N	C	D	I	E	U	L	F	I	K	I	R
M	G	E	L	H	I	I	S	J	S	P	K	R	A	G	T	C	O	O
G	V	M	G	L	N	M	T	O	N	A	O	A	H	L	I	I	M	P
I	E	S	N	G	C	E	R	E	B	R	A	L	P	A	L	S	Y	I
T	R	I	I	P	Q	E	A	R	S	A	I	G	E	U	A	N	E	A
S	T	T	H	T	L	U	B	V	A	L	X	I	C	C	H	O	L	W
A	I	I	S	C	X	A	I	Y	E	Y	E	A	O	O	P	I	I	Z
S	G	T	S	T	A	K	S	L	R	S	R	O	R	M	E	T	T	S
L	O	O	N	Y	T	O	M	T	O	I	O	L	D	A	C	O	I	L
S	T	I	N	N	I	T	U	S	H	S	N	O	Y	E	N	M	S	O
O	E	P	I	L	E	P	S	Y	C	H	A	C	H	A	E	T	V	T

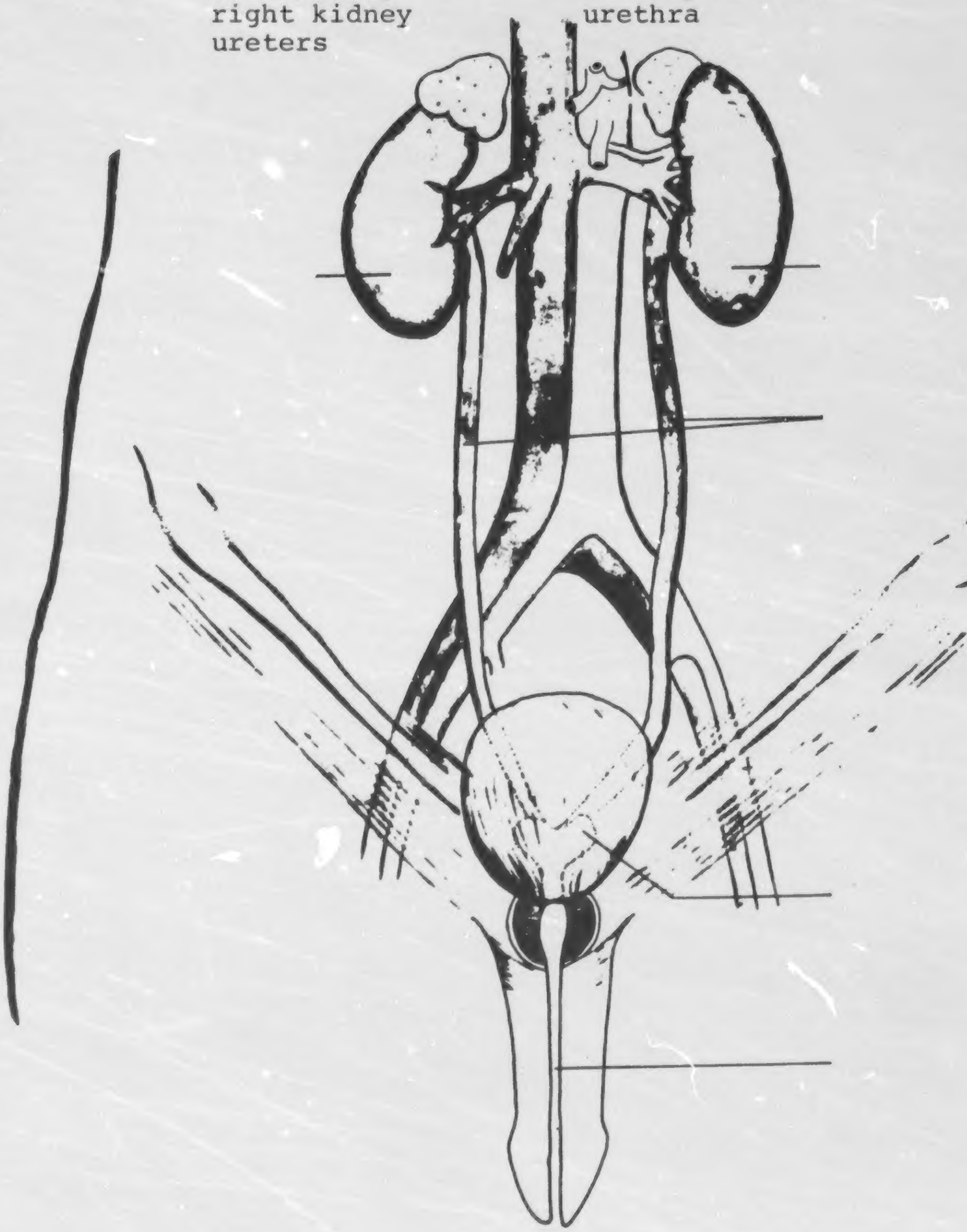
UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET 17--DIAGRAM OF THE URINARY SYSTEM

Directions: Label the following parts of the diagram of the urinary system.

left kidney
right kidney
ureters
urinary bladder
urethra



UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #18--WORD SCRAMBLE

Directions: Unscramble the letters below to form the following words associated with disorders of the urinary system.

anuria
calculus
cystitis
dysuria
edema
glycosuria
incontinence
nephritis
oliguria
polyuria
pyelitis
uremia
urethritis

1. TISPLYEI _ _ _ _ _ _ _ _
2. RISTHUREIT _ _ _ _ _ _ _ _ _ _
3. RUNAIA _ _ _ _ _ _
4. RUDIAYS _ _ _ _ _ _ _
5. PULORIAY _ _ _ _ _ _ _ _
6. RIMUEA _ _ _ _ _ _
7. CULUSACL _ _ _ _ _ _ _
8. DAEME _ _ _ _ _
9. GUROILIA _ _ _ _ _ _ _ _
10. STITIYSC _ _ _ _ _ _ _ _
11. CONTINEENCIN _ _ _ _ _ _ _ _ _ _ _ _
12. CYSURIALOG _ _ _ _ _ _ _ _ _ _
13. RIPHTISEN _ _ _ _ _ _ _ _ _

UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #19--IDENTIFICATION OF FUNCTION OF PARTS OF THE REPRODUCTIVE SYSTEM

Directions: The functions of various parts of the reproductive system are given below. Using the information sheet, place the name of the indicated part in the blank spaces.

1. Sac contining male gonads ______________ 1.
2. Tube inside testis in which sperm cells are collected and stored until they mature and become motile ______________ 2.
3. Pelvic floor (commonly used to mean the area between vaginal opening and anus) ______________ 3.
4. External parts of the female reproductive system ______________ 4.
5. Male reproductive glands, produce sperm cells and secrete male hormones ______________ 5.
6. Gland that surrounds the neck of the bladder and urethra. Ducts open into prostatic portion of urethra, produces fluid which is a constituent of semen and that helps to maintain motility of sperm cells ______________ 6.
7. Fringelike extensions from the abdominal openings of the fallopian tubes ______________ 7.
8. Female sex cell ______________ 8.
9. Male sex cell ______________ 9.
10. Muscular tube connecting the uterus with the exterior of the body ______________ 10.
11. Male organ of sexual intercourse ______________ 11.

12. Continuation of the epididimis extending to the juncture with the seminal vesicle ______________12.

13. Primary reproductive organs of the female that produce ova ______________13.

14. Organ for containing and nourishing the embryo during pregnancy ______________14.

15. Duct leading from point near ovaries to the uterus, transports ovum from body cavity to uterus ______________15.

16. Tubes extending from the area of the urinary bladder to the ductus deferens. Secretes a mucoid substance which nourishes sperm cells ______________16.

UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #20--WORD SCRAMBLE

Directions: Unscramble the letters below to form words associated with pregnancy and the menstrual cycle.

1. CLAPTENA _ _ _ _ _ _ _ _ _
2. IZOFRETAITNLI _ _ _ _ _ _ _ _ _ _ _ _ _ _
3. VOUM _ _ _ _
4. TSUREU _ _ _ _ _ _
5. STUREMNTANIO _ _ _ _ _ _ _ _ _ _ _ _ _
6. PUANEMSOE _ _ _ _ _ _ _ _ _ _
7. MHNOERO _ _ _ _ _ _ _ _
8. CYNAGRPEN _ _ _ _ _ _ _ _ _ _

UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #21--WORD FIND PUZZLE

Directions: The following terms, which are disorders of the reproductive system and of pregnancy, can be found in the puzzle. They may be written forward, backward, vertically, horizontally, diagonally. Circle each term as you find it.

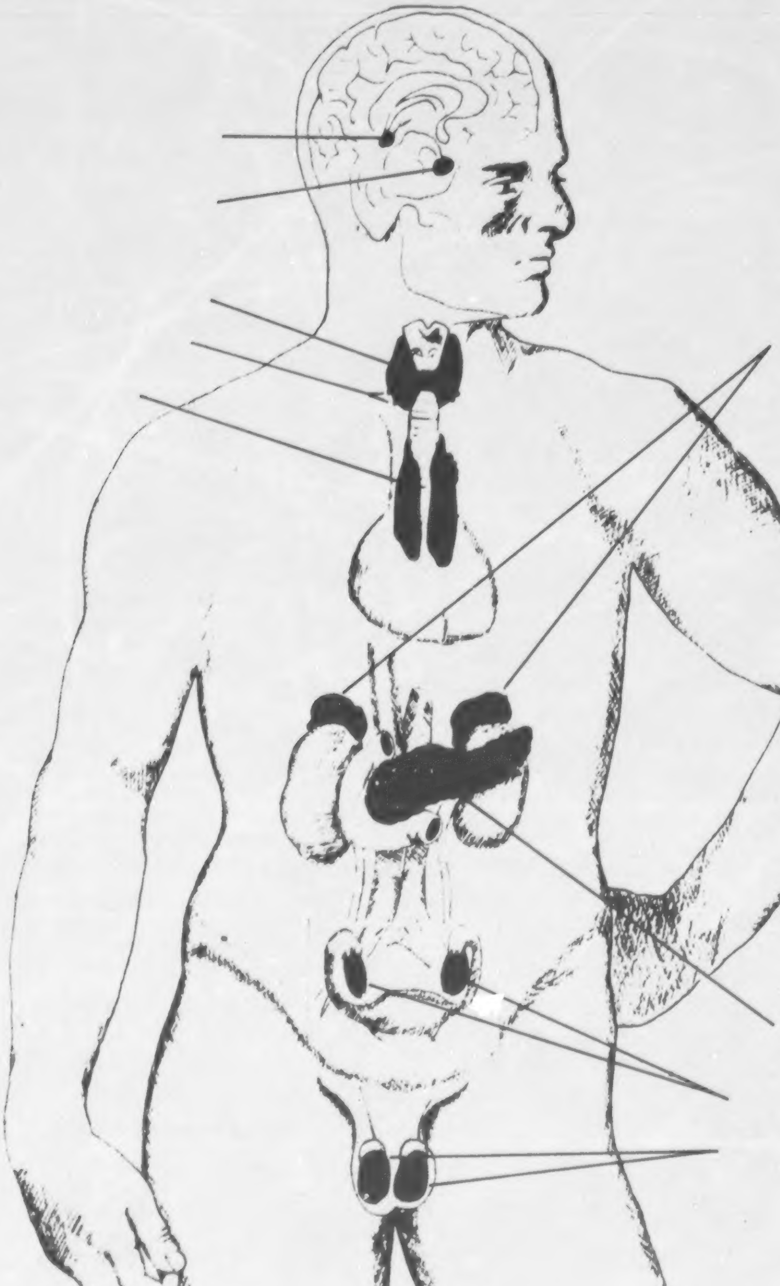
abortion
amenorrhea
cryptorchidism
dysmenorrhea
gonorrhea
hermaphroditism
inguinal hernia
leukorrhea
miscarriage
orchitis
prostatism
salpingitis
sterility
syphilis
tumor

Y	A	I	N	R	E	H	L	A	N	I	U	G	N	I
C	O	S	V	A	W	T	B	Q	U	A	S	H	R	T
N	L	E	U	K	O	R	R	H	E	A	I	E	S	O
A	L	S	I	S	O	M	I	H	P	B	T	R	T	P
N	M	E	G	A	I	R	R	A	C	S	I	M	S	R
G	G	O	N	O	R	R	H	E	A	T	H	A	T	M
E	H	P	M	P	O	S	A	B	T	O	C	P	E	S
R	I	R	N	N	P	T	B	U	U	P	R	H	F	I
P	J	S	E	O	J	U	M	V	V	S	O	R	G	T
C	K	M	F	P	K	O	N	O	I	T	R	O	B	A
I	A	E	H	R	R	O	N	E	M	S	Y	D	C	T
P	L	A	C	E	N	T	A	P	R	E	V	I	A	S
O	M	B	D	F	Y	T	I	L	I	R	E	T	S	O
T	S	Y	P	H	I	L	I	S	J	S	F	I	T	R
C	R	Y	P	T	O	R	C	H	I	D	I	S	M	P
E	S	A	L	P	I	N	G	I	T	I	S	M	N	O

UNIT XX

ANATOMY AND PHYSIOLOGY

ASSIGNMENT SHEET #22--LABEL DIAGRAM OF ENDOCRINE GLANDS



UNIT XX

ANATOMY AND PHYSIOLOGY

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1--Label Diagram of Body Cavities

See XX-TM-1

Assignment Sheet #2--Label Diagrams of Lateral and Posterior Views of Body

See XX-TM-2

Assignment Sheet #3--Label Diagram of Skeleton--Anterior View

See XX-TM-3

Assignment Sheet #4--Label Diagram of Skeleton--Posterior View

See XX-TM-4

Assignment Sheet #5--Questions About the Skeletal and Muscular Systems

1. A. Supports and gives shape to body

   B. Protects internal organs

   C. Makes movement possible

   D. Produces blood cells

2. A. Simple fracture--bone is broken, but there is no external wound

   B. Compound fracture--bone is broken, skin and soft tissues are torn, bone protrudes through skin

   C. Greenstick fracture--incomplete break in which the bone is partially broken and partially bent

3. Answer should include any 5 of the following:

   A. Kyphosis--increase in curvature of the spine resulting in a hunchbacked appearance

B. Lordosis--exaggerated inward curvature in the lumbar region of the spinal column

C. Osteomyelitis--inflammation of bone

D. Rickets--bones fail to calcify sufficiently and growth is hampered

E. Scoliosis--side to side curvature of the spine

F. Sprain--wrenching of a joint with injury to ligaments

G. Tuberculosis--bone disease caused by tubercle bacillus

H. Bursitis--inflammation of the bursa. A bursa is a sac or cavity filled with synovial fluid

I. Arthritis--inflammation of bones at the joints

4. A. Skeletal (voluntary, striated)

B. Smooth (involuntary)

C. Cardiac

5. A. Muscular dystrophy--progressive wasting and weakness of muscles

B. Paralysis--muscles do not contract because nerves controlling them are diseased or injured

C. Muscle atrophy--decrease in muscle size due to disuse

D. Hypertrophy--increase in muscle size resulting from increased use

E. Spasm--sudden, violent, and involuntary contraction of a muscle

Assignment Sheet #6--Label Parts of the Digestive System

See XX-TM-5

Assignment Sheet #7-- Identify Enzymes and Their Action

1. pepsin
2. bile
3. enterokinase
4. ptyalin
5. amylopsin
6. sucrase
7. rennin
8. maltase
9. lactase

Assignment Sheet #8--Word Find Puzzle

D P Y O R R H E A A X T S O P F
E A O I C U E S P M U M T U L R
N D O M I J A I F D E D A A C I
T Y O E R T R A B I Q R T U H E
A S N R R Y T O L A P U S G O N
L E Y T H T B N K B L S W I L D
C N C E O I U J L E G I R N E L
A T N S S R R O N T N T M G C Y
R E Y T I O N C U E I I O I Y P
I R O Y S N E O T S T C E V S E
E Y L G C Y D N R T I I N I T O
S T O M A T I T I S M D O T I P
O E R O N E C R B J O N I I T L
B C B D C R E C L U V E A S I E
A T F X E S I T I T A P E H S T
D I A R R H E A N Y Z P B C R O
O C H O L E L I T H I A S I S O

Assignment Sheet #9--Diagram of the Heart

See XX-TM-7

Assignment Sheet #10--Scrambled Letter Puzzle

1. aneurysm
2. arteriosclerosis
3. endocarditis
4. gangrene
5. thrombus
6. phlebitis
7. murmur
8. ischemia
9. hemorrhage
10. hypertension

Assignment Sheet #11--Diagram of Parts of Respiratory System

See XX-TM-8

Assignment Sheet #12--Diagram of Brain

See XX-TM-9

Assignment Sheet #13--Diagram of Neuron

See XX-TM-10

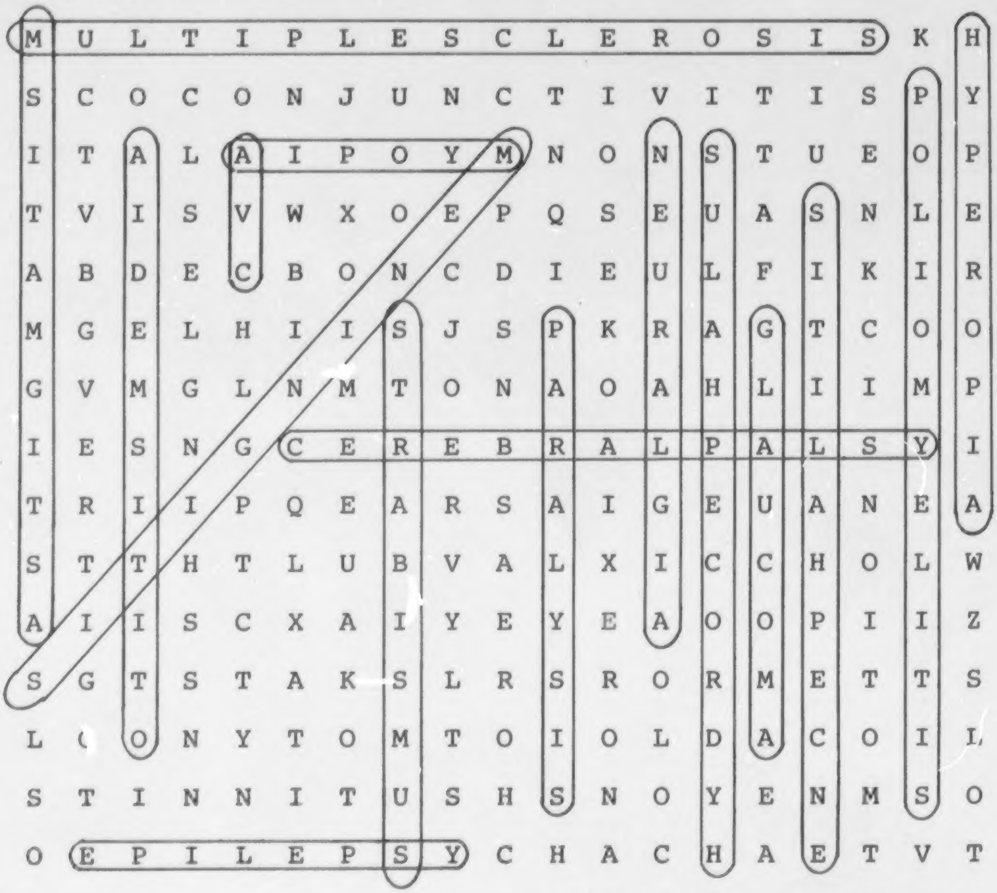
Assignment Sheet #14--Diagram of the Eye

See XX-TM-11

Assignment Sheet #15--Diagram of the Ear

See XX-TM-12

Assignment Sheet #16--Word Find Puzzle



M	U	L	T	I	P	L	E	S	C	L	E	R	O	S	I	S	K	H
S	C	O	C	O	N	J	U	N	C	T	I	V	I	T	I	S	P	Y
I	T	A	L	A	I	P	O	Y	M	N	O	N	S	T	U	E	O	P
T	V	I	S	V	W	X	O	E	P	Q	S	E	U	A	S	N	L	E
A	B	D	E	C	B	O	N	C	D	I	E	U	L	F	I	K	I	R
M	G	E	L	H	I	I	S	J	S	P	K	R	A	G	T	C	O	O
G	V	M	G	L	N	M	T	O	N	A	O	A	H	L	I	I	M	P
I	E	S	N	G	C	E	R	E	B	R	A	L	P	A	L	S	Y	I
T	R	I	I	P	Q	E	A	R	S	A	I	G	E	U	A	N	E	A
S	T	T	H	T	L	U	B	V	A	L	X	I	C	C	H	O	L	W
A	I	I	S	C	X	A	I	Y	E	Y	E	A	O	O	P	I	I	Z
S	G	T	S	T	A	K	S	L	R	S	R	O	R	M	E	T	T	S
L	O	O	N	Y	T	O	M	T	O	I	O	L	D	A	C	O	I	L
S	T	I	N	N	I	T	U	S	H	S	N	O	Y	E	N	M	S	O
O	E	P	I	L	E	P	S	Y	C	H	A	C	H	A	E	T	V	T

Assignment Sheet #17--Diagram of the Urinary System

See XX-TM-13

Assignment Sheet #18--Word Scramble

1. pyelitis
2. urethritis
3. anuria
4. dysuria
5. polyuria
6. uremia
7. calculus
8. edema
9. oliguria
10. cystitis
11. incontinence
12. glycosuria
13. nephritis

Assignment Sheet #19--Identification of Function of Parts of the Reproductive System

1. scrotum
2. epididymis
3. perineum
4. vulva
5. testes
6. prostate
7. fimbriae
8. ovum
9. sperm cell
10. vagina
11. penis
12. ductus deferens
13. ovaries
14. uterus
15. fallopian tubes
16. seminal vesicle

Assignment Sheet #20--Word Scramble

1. placenta
2. fertilization
3. ovum
4. uterus
5. menstruation
6. menopause
7. hormone
8. pregnancy

Assignment Sheet #21--Word Find Puzzle

Y	A	I	N	R	E	H	L	A	N	I	U	G	N	I
C	O	S	V	A	W	T	B	Q	U	A	S	H	R	T
N	L	E	U	K	O	R	R	H	E	A	I	E	S	O
A	L	S	I	S	O	M	I	H	P	B	T	R	T	P
N	M	E	G	A	I	R	R	A	C	S	I	M	S	R
G	G	O	N	O	R	R	H	E	A	T	H	A	T	M
E	H	P	M	P	O	S	A	B	T	O	C	P	E	S
R	I	R	N	N	P	T	B	U	U	P	R	H	F	I
P	J	S	E	O	J	U	M	V	V	S	O	R	G	T
C	K	M	F	P	K	O	N	O	I	T	R	O	B	A
I	A	E	H	R	R	O	N	E	M	S	Y	D	C	T
P	L	A	C	E	N	T	A	P	R	E	V	I	A	S
O	M	B	D	F	Y	T	I	L	I	R	E	T	S	O
T	S	Y	P	H	I	L	I	S	J	S	F	I	T	R
C	R	Y	P	T	O	R	C	H	I	D	I	S	M	P
E	S	A	L	P	I	N	G	I	T	I	S	M	N	O

Assignment Sheet #22--Label Diagram of Endocrine System

See XX-TM-14

UNIT XX

ANATOMY AND PHYSIOLOGY

UNIT TEST

1. Organization and general plan of the body

   a. Complete the following statements by adding the word that best completes the statements.

      (1) The body cavity that is just above the diaphragm and is enclosed by the rib cage is the ____________ 1.

      (2) The above named body cavity contains the trachea, esophagus, heart, and ____________ 2.

      (3) The body cavity in the ventral space below the diaphragm is the ____________ 3.

      (4) The body cavity located in the skull and which contains the brain, is the ____________ 4.

      (5) The spinal cavity, located in the vertebral column, contains the ____________ 5.

   b. Identify body planes from the following descriptions.

      (1) Plane that divides the body into anterior and posterior sections ____________ 1.

      (2) Plane that divides the body into right and left sections ____________ 2.

      (3) Plane that divides the body into upper and lower sections ____________ 3.

   c. Identify body directions from the following descriptions.

      (1) Toward the head, upper, above ____________ 1.

      (2) Toward the feet, lower, below ____________ 2.

      (3) Front, in front of ____________ 3.

      (4) Back, in back of ____________ 4.

      (5) Toward the midline ____________ 5.

(6) Away from the midline, toward the side of ____________ 6.

(7) Toward or near the trunk of the body, near the point of origin ____________ 7.

(8) Away from the point of origin ____________ 8.

d. Label the following diagrams

(1) Location of Body Cavities, Lateral View see page XX-145

(2) Human Body--Lateral and Posterior Views see page XX-147

2. Skeletal and muscular systems

a. Match the terms on the right with their correct definitions, using letter answers.

_____(1) Tissue which connects bones at a joint

_____(2) Motion away from midline of the body, as raising arm to a shelf

_____(3) Point of juncture between two or more bones

_____(4) Motion toward the midline of the body

_____(5) Movement that straightens bones at their joints

_____(6) Tissue which connects muscle to bone

_____(7) Decrease in the angle between two bones at their joint

_____(8) Lubricating fluid of the joints

a. abduction

b. adduction

c. extension

d. flexion

e. joint

f. ligament

g. synovial fluid

h. tendon

b. List four functions of the skeleton.

(1)

(2)

(3)

(4)

c. Indicate whether each of the following is a part of the axial or appendicular skeleton.

(1) leg ______

(2) face ______

(3) ribs ______

(4) ear bones ______

(5) shoulder girdle ______

(6) hands ______

(7) feet ______

(8) vertebrae ______

(9) arm ______

(10) skull ______

d. Complete the following statements, using one of the terms listed below.

simple fracture
compound fracture
greenstick fracture
dislocation
kyphosis
lordosis
osteomyelitis

bursitis
arthritis
tuberculosis
sprain
scoliosis
rickets

(1) An exaggerated inward curvature of the spine resulting in a hunchbacked appearance is ______________.

(2) A fracture in which the bone is broken, but there is no external wound is a (an) ______________.

(3) An inflammation of the bursa is ______________.

(4) An inflammation of bones at the joints is ______________.

(5) A displacement of bone from its normal position in a joint is _______________.

(6) An incomplete break in which the bone is partially broken and partially bent is a (an) _______________.

(7) An inflammation of bone is _______________.

(8) The wrenching of a joint with injury to the ligaments is a (an) _____ _________.

(9) A bone disease caused by the tubercle bacillus is _______________.

(10) A fracture in which the bone is broken, skin and soft tissues are torn, and bone protrudes through the skin is a (an _______________.

(11) A disease in which the bones fail to calcify sufficiently and growth is hampered is _______________.

(12) The side to side curvature of the spine is _______________.

(13) An exaggerated inward curvature in the lumbar region of the spinal column is _______________.

e. List three types of muscles.

(1) _______________________

(2) _______________________

(3) _______________________

f. (1) Label the following parts of the anterior view of the skeleton. See page XX-149.

(a) ________________ (i) ________________

(b) ________________ (j) ________________

(c) ________________ (k) ________________

(d) ________________ (l) ________________

(e) ________________ (m) ________________

(f) ________________ (n) ________________

(g) ________________ (o) ________________

(h) ________________

(2) Label the following parts of the posterior view of the skeleton. See page XX-151.

(a) ____________________
(b) ____________________
(c) ____________________
(d) ____________________
(e) ____________________
(f) ____________________
(g) ____________________
(h) ____________________

(i) ____________________
(j) ____________________
(k) ____________________
(l) ____________________
(m) ____________________

3. The digestive system

a. Match the terms to the correct definitions using letter answers.

_____(i) Body waste, residue of digestion, discharge from anus

_____(2) The taking up of fluids or other substances by the skin or mucous membrane

_____(3) The digestive juice secreted by the liver

_____(4) The changing of insoluble food materials to a soluble form by the action of enzymes

_____(5) The continuous tube which extends from the mouth to the anus. The process of digestion takes place in this tube

_____(6) The lack of needed food in the body or improper absorption and distribution of food by the body

_____(7) The protein substances produced by the cells that bring about chemical reactions in digestion

_____(8) The discharge of fecal material from the rectum

a. absorption

b. alimentary canal

c. bile

d. defecation

e. digestion

f. enzyme

g. feces

h. malnutrition

b. Give the function of each part of the digestive system by writing the name of the appropriate part in the blank space in front of each statement.

Example Function

__mouth___ (1) receives food

__________ (2) completes digestion of food begun in stomach

__________ (3) absorbs water

__________ (4) secretes bile

__________ (5) cut, grind, or tear food

__________ (6) speech

__________ (7) prepares food for digestion

__________ (8) dissolves food in mouth

__________ (9) secretes gastric juices

__________ (10) secretes pancreatic juice

__________ (11) manufactures insulin

__________ (12) stores and concentrates bile

__________ (13) eliminates waste products of digestion

__________ (14) absorbs end products of digestion into blood and lymph

__________ (15) carries on limited absorption of water, alcohol, and some drugs

__________ (16) secretes bile

__________ (17) ejects bile into duodenum as needed during digestion

Digestive Part

mouth

tongue

teeth

salivary glands

stomach

small intestine

liver

gall bladder

pancreas

large intestine

DIGESTIVE JUICES AND ENZYMES

Digestive juices and enzymes	Source	Place of Action	Action of enzyme or digestive juice
Saliva	Salivary glands		
Ptyalin		____1____	Begins starch digestion
Gastric juice	Stomach	Stomach	
Pepsin			Begins protein digestion
____2____			Emulsifies fats
Rennin (children)			____3____
Hydrochloric acid			Softens connective tissue in meat Kills some pathogenic bacteria Activates gastric enzymes
Pancreatic juice	____4____	Small intestine	
____5____			Acts on protein
Amylopsin			Acts on ____6____
Lipase			Acts on fats
Intestinal juice	Small intestine	Small intestine	
Enterokinase			Acts on ____7____
____8____			Changes sucrose to simple sugar
Lactase			Changes lactose to simple sugar
Maltase			Changes ____9____ to simple sugar
Bile	____10____	Small intestine	Emulsifies fats

__________(18) contains the enzyme, ptyalin, which digests starch

__________(19) contains taste buds, which identify sweet, salt, sour, and bitter tastes

__________(20) forms antibodies

c. The chart of digestive juices and enzymes has some lettered blank spaces. Place the correct answers in the following numbered spaces. See page XX-119.

(1) ________________ (6) ________________

(2) ________________ (7) ________________

(3) ________________ (8) ________________

(4) ________________ (9) ________________

(5) ________________ (10) ________________

d. Identify each of the following disorders of the digestive tract.

(1) dental caries--

(2) mumps--

(3) gastritis--

(4) nausea--

(5) appendicitis--

(6) constipation--

(7) diarrhea--

(8) cirrhosis--

(9) hepatitis--

(10) diabetes--

e. Label the indicated parts of the diagram of the digestive system. See page XX-153.

(1)____________________ (6)____________________

(2)____________________ (7)____________________

(3)____________________ (8)____________________

(4)____________________ (9)____________________

(5)____________________ (10)____________________

4. The circulatory system

a. List the two main functions of the blood

(1)

(2)

b. Answer the following questions about the components of blood using short answers.

(1) What is the liquid part of blood called?

(2) Where are red blood cells formed?

(3) What chemical element do rbc transport from the lungs to the cells?

(4) What is the function of white blood cells?

(5) What is the function of platelets?

c. When is it important to determine one's blood type?

(1)

(2)

d. When is it important to do an Rh determination?

(1)

(2)

e. Identify the numbered parts of the heart on the diagram. See page XX-155.

(1) ____________________ (6) ____________________

(2) ____________________ (7) ____________________

(3) ____________________ (8) ____________________

(4) ____________________ (9) ____________________

(5) ____________________

f. Define:

(1) pulse

(2) blood pressure

(3) systolic blood pressure

(4) diastolic blood pressure

g. Complete the following statements using the diseases and disorders of the circulatory system listed below.

anemia
aneurysm
arteriosclerosis
atherosclerosis
coronary occlusion
coronary thrombosis
embolus
hemorrhage
hypertension
ischemia
murmur
phlebitis
thrombus
varicose veins

(1) Inflammation of a vein ________________ 1.

(2) Copius bleeding ________________ 2.

(3) Abnormal heart sound ________________ 3.

(4) Closing off of a coronary artery ________________ 4.

(5) Thickening, hardening, and loss of elasticity of walls of blood vessels, especially arteries ________________ 5.

(6) A blood clot or foreign material carried by the blood stream into a small vessel causing its obstruction ________________ 6.

(7) Dilatation of veins, usually in lower extremities ________________ 7.

(8) Insufficent blood supply to a given part of the body ________________ 8.

(9) High blood pressure ________________ 9.

(10) A disorder of the lining of the arteries in which fat is deposited forming plaques that diminish the width of the vessel ________________ 10.

(11) Closing of the coronary artery by a blood clot ________________ 11.

(12) General condition in which the blood is deficient in the number of red blood cells or in hemoglobin _______________12.

(13) Blood clot _______________13.

(14) Abnormal dilation of a blood vessel _______________14.

5. The respiratory system

a. Match the terms on the right to the correct difinition using letter answers.

_____(1) Normal respiration

_____(2) The exchange of carbon dioxide and oxygen in the lungs

_____(3) Bluish color of skin caused by oxygen deficiency in the blood

_____(4) The moving of molecules from a region of higher concentration to a region of lower concentration of molecules

_____(5) The phase during which air is drawn into the lungs

_____(6) The exchange of carbon dioxide and oxygen in the body cells

_____(7) The expulsion of air from the alveoli of the lungs

_____(8) Inhaling and exhaling air

a. breathing

b. cyanosis

c. diffusion

d. eupnea

e. exhalation

f. external respiration

g. inhalation

h. internal respiration

b. Answer the following questions about the parts of the respiratory system, their location and function. Use short answers.

(1) What are the cavities in the bones of the skull which open into the nasal cavity called?

(2) What part of the respiratory system contains the vocal cords?

(3) Which part of the respiratory system extends from the larynx to the bronchi?

(4) Name the tiny, thin-walled air sacs which make up the lung.

(5) What is the name of the structure through which air enters the respiratory system?

(6) What is the function of the diaphragm?

(7) What is the name of the serous membrane that covers the lungs and lines the chest cavity?

c. Identify the terms pertaining to types of abnormal breathing by completing the following statements.

(1) A lack of oxygen is ______________.

(2) An oxygen deficiency with a resulting increase in carbon dioxide in the tissues is ______________.

(3) Abnormally increased breathing is ______________.

(4) Respirations gradually increase in rapidity and volume until they reach a climax; then gradually subside, cease entirely for a few seconds, then begin again in ______________ respiration.

(5) The cessation of breathing is ______________.

d. Identify the following diseases and disorders of the respiratory system by answering the following questions. Choose the correct word from those listed after each of the following statements.

(1) Allergic reaction, characterized by localized swelling in the walls of the small bronchioles, with secretion of thick mucus

and spasm of the smooth muscle walls of the bronchioles. (asthma), (common cold), (epistaxis), (pleurisy) ____________________

(2) Inflammation of lungs and pleurae, caused by a bacterium. (Occasionally invades other parts of the body.) (sinusitis), (cancer of the lung), (bronchiectasis), (tuberculosis)

____

(3) Inflammation of a sinus. (tuberculosis), (cough), (epistaxis), (sinusitis)

____

(4) Inflammation of the alveoli of the lung; maybe caused by bacterium or virus. (pleurisy), (pneumonia), (atelectasis), (sinusitis) ____________________

(5) Inflammation of the pleura, usually accompanies infections of the lung. (pneumonia), (pleurisy), (influenza), (asthma)

____

(6) Most widespread of all communicable diseases, characterized by swollen and inflamed mucous membrane of the nose and throat with copious discharge. (common cold), (atelectasis), (cancer of the lung), (sinusitis)

____

(7) Acute, contagious disease, characterized by inflammation of the upper respiratory tract and generalized aches and pains. (epistaxis), (pleurisy), (influenza), (asthma)

____

(8) Mechanism for clearing obstruction from airway. (atelectasis), (bronchiectasis), (cough), (hay fever) ____________________

(9) Sensitivity to foreign proteins causing watery discharge from eyes and nose. (hay fever), (pneumonia), (cancer of the lung), (emphysema) ____________________

(10) Distention of alveoli due to bronchial obstruction. (cough), (epistaxis), (cancer of the lung), (emphysema) ____________________

(11) Nose bleed. (epistaxis), (common cold), (atelectasis) (influenza) ____________________

e. Identify the indicated parts of the diagram of the respiratory system. See page XX-157.

(1)________________ (6)________________

(2)________________ (7)________________

(3)________________ (8)________________

(4)________________ (9)________________

(5)________________ (10)________________

6. The nervous system

a. List the three divisions of the nervous system.

(1)

(2)

(3)

b. Identify the main divisions of the brain by completing the following statements.

(1) The largest part of the brain is the ____________ 1.

(2) The part of the brain that transmits impulses between the brain and the spinal cord is the ____________ 2.

(3) The part of the brain that coordinates muscular activities and balance is the ____________ 3.

(4) The part of the brain that transmits messages from the cerebrum to the cerebellum, and from the brain to the medulla is the ____________ 4.

c. Define meninges and cerebrospinal fluid and give their function.

(1) meninges--

(2) cerebrospinal fluid--

d. Answer the following questions about the structure and function of a neuron. Use short answers.

(1) A nerve cell body and its extensions is a ________________.

(2) Projections of a nerve cell that transmit impulses to the nerve cell body are ________________.

(3) Projections that transmits impulses away from the nerve cell is a (an) ________________.

(4) The minute space between the axon and dendrites of two nerve cells is called a (an) ________________.

e. (1) Label the lettered parts of the diagram of the eye. See page 159.

(a) ___________ (d) ___________ (g) ___________

(b) ___________ (e) ___________ (h) ___________

(c) ___________ (f) ___________ (g) ___________

(2) Discuss the physiology of vision.

(a)

(b)

(c)

(d)

f. (1) Label the lettered parts of the ear.
See page XX-161.

(a) ____________________ (g) ____________________

(b) ____________________ (h) ____________________

(c) ____________________ (i) ____________________

(d) ____________________ (j) ____________________

(e) ____________________ (k) ____________________

(f) ____________________ (l) ____________________

(2) Discuss the physiology of hearing

(a)

(b)

(c)

(d)

(e)

g. List five general senses.

(1) ____________________ (4) ____________________

(2) ____________________ (5) ____________________

(3) ____________________

h. Match the diseases and disorders on the right to their correct definitions.

_____ (1) Infection of the brain

_____ (2) Chronic, slowly progressive disease of the central nervous system due to degeneration of axons

_____ (3) Defect in vision in which light rays focus in front of retina (nearsightedness)

_____ (4) Acute viral disease which affects the brain and spinal cord. This virus may destroy motor nerve cells in the spinal cord causing paralysis

_____ (5) Inflammation of the middle ear

_____ (6) Temporary or permanent loss of function, especially loss of sensation or voluntary motion

_____ (7) Congenital brain disorder characterized by diverse disorders of muscles varying from weakness to complete paralysis

_____ (8) An irregularity of the curvature of the lens or cornea of the eye, resulting in faulty vision

_____ (9) Severe, sharp pain along the course of a nerve

_____ (10) Destruction of brain membrane as a result of hemorrhage from cerebral blood vessels

(a) astigmatism

(b) cerebal palsy

(c) C.V.A.

(d) encephalitis

(e) epilepsy

(f) glaucoma

(g) hydrocephalus

(h) hyperopia

(i) meningitis

(j) multiple sclerosis

(k) myopia

(l) neuralgia

(m) otitis media

(n) paralysis

(o) poliomyelitis

(p) strabismus

_____(11) Inflammation of the membrane covering the brain and spinal cord

_____(12) Impaired vision or blindness as a result of excess pressure of eye fluid

_____(13) Gross enlargement of the cranium and atrophy of the brain due to accumulation of excessive amounts of fluid in and around the brain

_____(14) Defect in vision in which light rays focus behind the retina (farsightedness)

_____(15) Chronic disorder with abnormality of brain function without apparent changes in nerve tissue (falling sickness)

_____(16) Muscles of eyeballs do not coordinate, so the two eyes do not work together

i. Label the numbered parts of the diagram of the brain. See page XX-163.

(1)

(2)

(3)

(4)

7. The urinary system

a. Match the terms on the right to their correct definitions using letter answers.

_____ (1) urination

_____ (2) instrument used for interior examination of urinary bladder and ureters

_____ (3) protein found in blood, may be present in urine in some disease conditions

_____ (4) involuntary bed-wetting in children over three years of age

_____ (5) transfer of tissue or organ from one individual to another

_____ (6) chief nitrogenous constituent of urine, an end product of protein metabolism

_____ (7) tube for removing fluids from or injecting fluids into a body cavity, as the urinary bladder

_____ (8) the elimination of waste products from the body

_____ (9) the diffusion of a dissolved substance through a semipermeable membrane

(a) albumin

(b) catheter

(c) cystoscope

(d) dialysis

(e) enuresis

(f) excretion

(g) micturition

(h) transplant

(i) urea

b. Complete the following statements about the parts of the urinary system.

(1) The tube passing from the urinary bladder to the exterior of the body is the _____________

(2) The pair of bean-shaped organs located on the posterior abdominal wall are the ____________

(3) The muscular bag in which urine collects is the ____________

(4) The tubes extending from the kidneys to the urinary bladder are the ____________

c. Discuss the functions of the urinary system.

(1)

(2)

(3)

d. Give four steps in the formation of urine.

(1)

(2)

(3).

(4)

e. Identify disorders of the urinary system by completing the following statements.

(1) A diminished amount of urine formed is called ____________

(2) The inability to retain urine is ____________

(3) The presence of glucose in urine is ____________

(4) A kidney stone is a (an) ____________

(5) The condition in which body tissues contain an excessive amount of tissue fluid is ____________

(6) Inflammation of the urethra is ____________

(7) Severe inflammation of the kidney (Bright's disease) is ____________

(8) Painful urination is ____________

(9) Inflammation of the bladder is ____________

(10) Excessive secretion and discharge of urine is ____________

(11) The condition in which wastes normally excreted by the kidney are retained in the blood is ____________

(12) A complete suppression of urine, or failure of kidney function is ____________

f. (1) How is the patient's blood cleansed by dialysis?

(2) Define kidney transplant.

g. What is the Living Bank?

h. Label the numbered parts of the diagram of the urinary system. See page XX-165.

(1)__________________

(2)__________________

(3)__________________

(4)__________________

8. The reproductive system

a. Match the terms on the right to their correct definitions using letter answers.

_____ (1) Surgical removal of the breast and axillary lymph nodes

_____ (2) Stain used in detection of cancer cells, particularly cells from the vagina and cervix

_____ (3) Male reproductive cell

_____ (4) Cyclic uterine bleeding which normally occurs at four-week intervals in the absence of pregnancy. Controlled by hormones

_____ (5) Surgical removal of all or part of the foreskin of the penis

_____ (6) Early or developing stage of any organism; in humans, the first weeks of uterine life

_____ (7) Secretion of reproductive organs of the male containing sperm cells and secretions from accessory reproductive glands

_____ (8) Latter stages in developing child in uterus from about the third month of pregnancy to birth

_____ (9) The union of an egg cell with a sperm cell

_____ (10) Surgical procedure resulting in sterilization of males. A portion of the ductus deferens on each side is removed, thus preventing sperm cells from reaching the urethra

(a) circumsision

(b) embryo

(c) fertilization

(d) fetus

(e) hermaphrodite

(f) hysterectomy

(g) mastectomy

(h) menstruation

(i) ovulation

(j) Papanicolaou stain

(k) placenta

(l) semen

(m) sperm cell

(n) vasectomy

_____(11) An individual with both male and female sex organs

_____(12) Surgical removal of the uterus

_____(13) Periodic discharge of ovum from ovary

_____(14) Structure in the pregnant uterus from which the fetus gets its nourishment

b. Identify the parts of the male and female reproductive system by completing the following statements.

(1) The muscular tube connecting the uterus with the exterior of the body is the ____________ (1)

(2) A female sex cell is a (an) ____________ (2)

(3) Male reproductive glands that product sperm cells and secreted male sex hormones are ____________ (3)

(4) The gland that surrounds the neck of the bladder and urethra, the ducts open into the prostatic portion of the urethra, is the ____________ (4)

(5) A male reproductive cell is a (an) ____________ (5)

(6) Th external parts of the female reproductive system are called the ____________ (6)

(7) The pelvic floor, commonly used to mean the area between the vaginal opening and the anus is the ____________ (7)

(8) The continuation of the epididymis extending to the juncture with the seminal vesicle is the ____________ (8)

(9) The sac containing the testes is the ____________ (9)

(10) The organ for containing and nourishing the embryo during pregnancy is the ____________(10)

(11) The primary reproductive organs of the female which produce ova are the ____________(11)

(12) The tube inside the testes in which sperm cells are collected and stored until they mature and become motile is the ____________(12)

(13) The male organ of sexual intercourse is the ____________(13)

(14) The fringelike extensions from the edges of the abdominal openings of the fallopian tubes are the ____________(14)

(15) The ducts (tube) that transport ova from the body cavity to the uterus are the ____________(15)

(16) The tubes extending from the area back of the urinary bladder to the ductus deferens, which secrete a mucoid substance that nourishes sperm cells are the ____________(16)

c. Review the sequence of events in the menstrual cycle, by answering the following questions. Use short answers, i.e., phrases, words, or simple serntences.

(1) How many days are required to complete the menstrual cycle? ______________________________(1)

(2) When in the menstrual cycle does ovulation occur? ______________________________(2)

(3) What part of the uterus prepares for implantation of the zygote? ________________(3)

(4) What becomes of the lining of the uterine wall if fertilization does not occur? ______________________________(4)

(5) Why is blood discharged for the uterus? ______________________________(5)

(6) After 4-7 days, what does the uterine wall prepare for? ____________________ (6)

(7) What does the beginning of menstruation indicate? ____________________ (7)

(8) What is the menopause? ____________________ (8)

(9) What controls the menstrual cycle? ____________________ (9)

d. The following statements pertain to the discussion of pregnancy. If the statement is true, write the word true in the blank space provided. If false, write the word false.

________ (1) Fertilization normally occurs when ovum is about one-third of the way down the fallopian tube.

________ (2) The zygote becomes implanted six to eight days after fertilization.

________ (3) The wall of the fallopian tube functions in the exchange of food, gases and wastes between mother and baby.

________ (4) No diseases from the mother may affect the baby.

________ (5) Pregnancy in humans normally lasts 280 days

e. Complete the following statements using the disorders of pregnancy listed below.

ectopic pregnancy
spontaneous abortion
induced abortion
criminal abortion
therapeutic abortion
miscarriage

(1) The loss of a fetus between 20 and 38 weeks of pregnancy is a (an) ____________

(2) An abortion performed by a physician for variety of reasons is a (an) ____________

(3) Abortions performed illegally are ____________

(4) The condition in which the fertilized ovum is implanted at a site other then the uterine cavity is called a (an) ______________

(5) An abortion that occurs without having been induced is a (an) ______________

(6) The termination of pregnancy by artificial means is called ______________

f. Identify disorders of the reproductive system by matching the disorders with their identifying phrases using letter answers.

_____ 1. Inability to reproduce

_____ 2. Swelling or enlargement, may occur in any part of the reproductive system

_____ 3. Painful menstruation

_____ 4. Rupture in abdominal wall in region of wall where testes descended from abdomen into scotum

_____ 5. Genitalia of one sex evident, secondary sex characteristics of opposite sex predominate

_____ 6. Inflammation of the fallopian tubes

_____ 7. Vaginal discharge

_____ 8. Absence of menstrual flow

_____ 9. Venereal disease caused by a bacterium, characterized by purulent urethral discharge

_____ 10. Both male and female sex organs found in the same person

(a) amenorrhea

(b) cryptorchidism

(c) dysmenorrhea

(d) gonorrhea

(e) hermaphroditism

(f) false hermaphroditism

(g) inguinal hernia

(h) leukorrhea

(i) orchitis

(j) prostatism

(k) salpingitis

(l) sterility

(m) syphilis

(n) tumor

_____11. Inflammation of the testes due to trauma, mumps, or other infection

_____12. Infectious venereal disease characterized by lesions which may involve any organ or tissue

_____13. Any condition resulting in obstruction of the prostate gland with accompanying retention of urine in the bladder

_____14. Failure of the testes to decend into the scrotum

9. The endocrine glands

a. Match the terms on the right with their correct definitions.

_____(1) Chemical element needed for the development and functioning of the thyroid gland

_____(2) A gland, the secretion of which is liberated directly into the blood stream, rather than by means of a duct

_____(3) Sex characteristics that are not directly concerned with reproduction, as tone of voice, facial hair, and breast development

_____(4) To dissolve and assimilate, to absorb again

_____(5) The secretion of milk

_____(6) The secretion of ductless glands which regulate the function of other organs

(a) endocrine gland

(b) hormone

(c) iodine

(d) lactation

(e) resorption

(f) secondary sex characteristics

b. Complete the following statements about the location and function of the endocrine glands listed. (The terms may be used more than once.)

adrenal glands

islets of Langerhans

ovaries

parathyroid glands

pituitary gland

testes

thyroid gland

(1) The ________ gland is located at the undersurface of the brain ______________(1)

(2) The ________ produce hormones that regulate the development of male secondary sex characteristics. ______________(2)

(3) The ________ glands are located above each kidney ______________(3)

(4) The cells found in the pancreas that produce insulin are called ______________(4)

(5) The two pair of glands embedded in the thyroid gland are the ______________(5)

(6) The ________ produce hormones which regulate the development and maintenance of the organs of the female reproductive system ______________(6)

(7) The ________ gland helps regulate body metabolism ______________(7)

(8) The ________ glands control the release of energy to meet emergencies and the use of water and salt by the body ______________(8)

(9) The hormones secreted by the ________ gland control the activity of the other glands ______________(9)

(10) The hormones secreted by the ________ gland affect growth, urine production, and contractions of involuntary muscles ______________(10)

c. Choose from the following list the endocrine disorder described. Place your answer in the blank space at the end of each phrase.

diabetes mellitus
giantism

dwarfism
simple goiter

exophthalmic goiter

(1) Disease results from lack of pituitary hormone. The patient is abnormally short ____________(1)

(2) Disease results from an oversecretion of thyroid gland. The eyes bulge, the face has a strained appearance, the patient suffers from weight loss, intense nervousness,and a rapid metabolic rate ____________(2)

(3) Disease results from an oversecretion of pituitary gland. The patient is abnormally tall ____________(3)

(4) Disease results from a lack of insulin. Glucose is excreted in the urine ____________(4)

(5) Disease results from a deficiency of iodine in the diet with enlargement of the thyroid gland ____________(5)

d. Label the numbered parts on the diagram of the endocrine glands. See page XX-167.

(1) ________________
(5) ________________

(2) ________________
(6) ________________

(3) ________________
(7) ________________

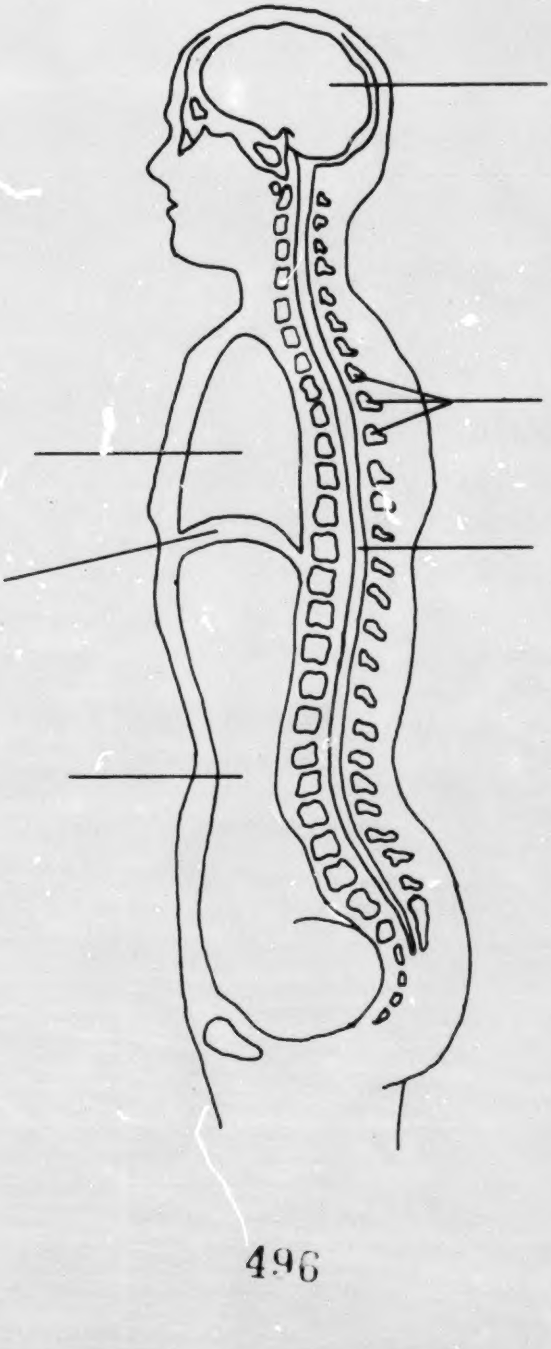
(4) ________________

UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAM OF BODY CAVITIES, LATERAL VIEW

Question #1, d, (1)--page XX-114

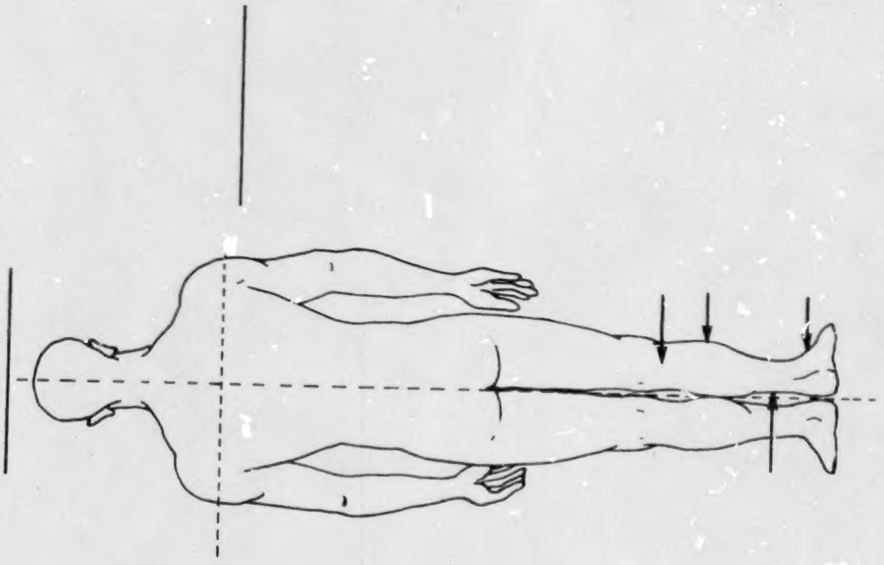


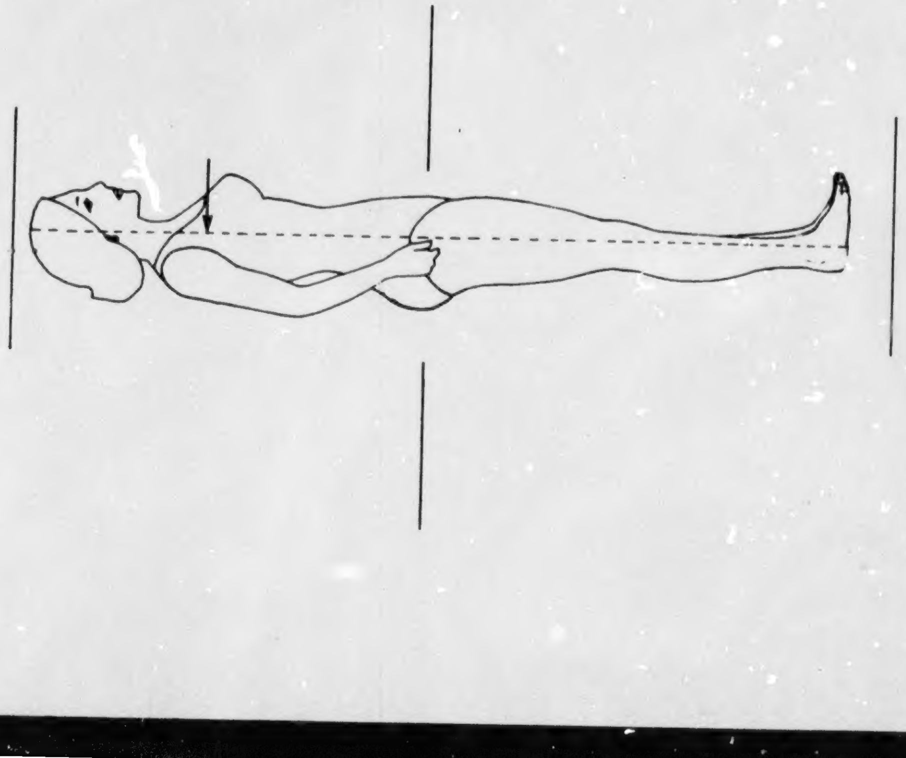
UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAMS OF HUMAN, BODY, LATERAL AND POSTERIOR VIEWS

Question #1, d, (2)--page XX-114



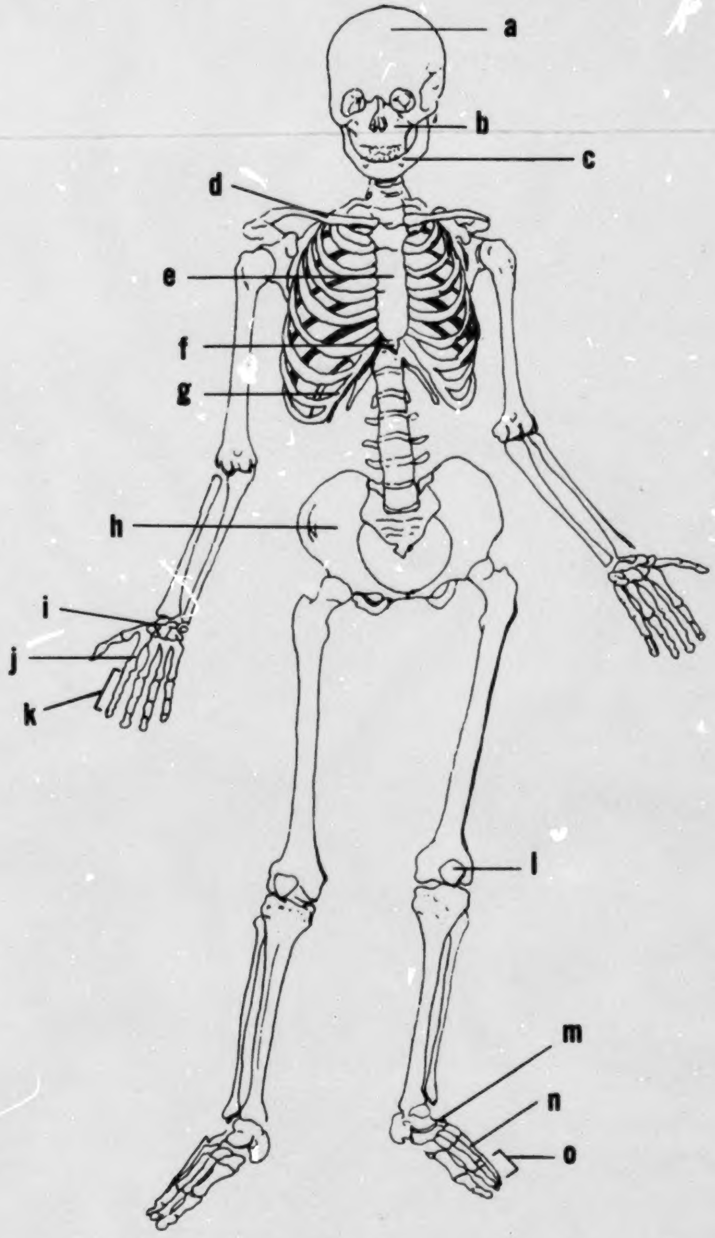


UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAM OF SKELETON, ANTERIOR VIEW

Question #2, f, (1)--page XX-116


a
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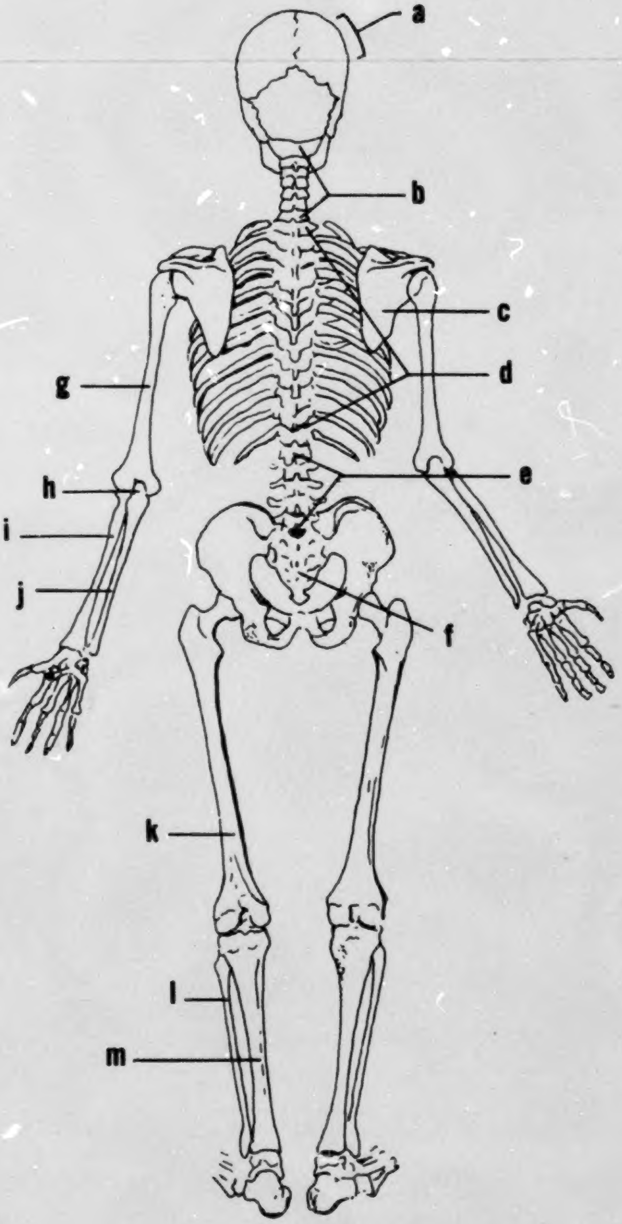
UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAM OF SKELETON, POSTERIOR VIEW

Question #2, f, (2)--page XX-117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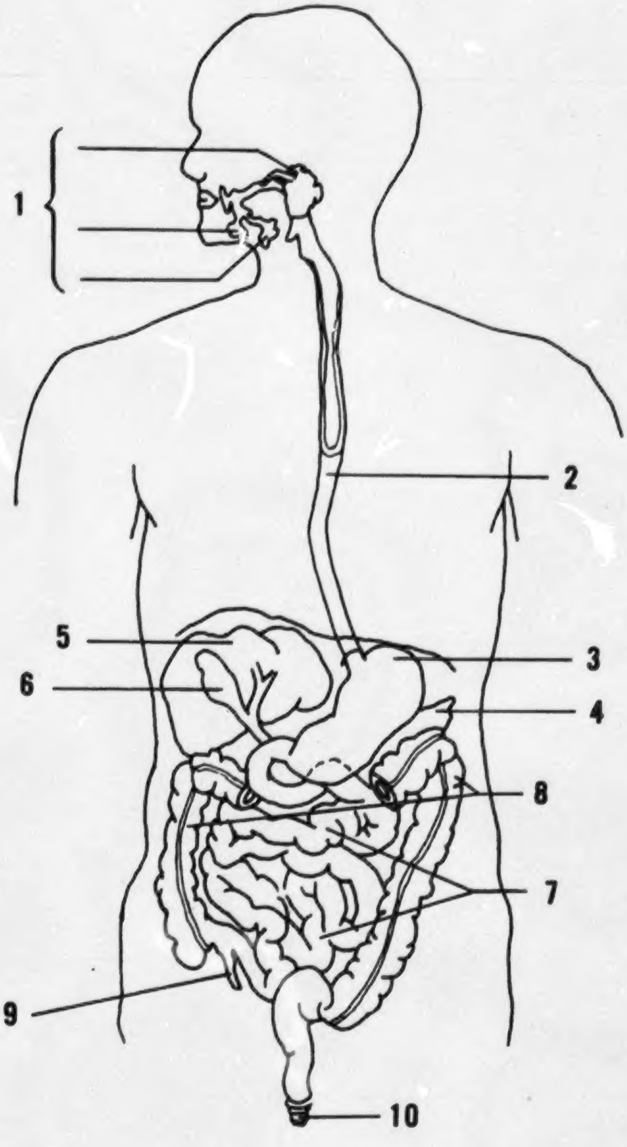
UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAM OF DIGESTIVE SYSTEM

Question #5, e--page XX-122


1
2
5
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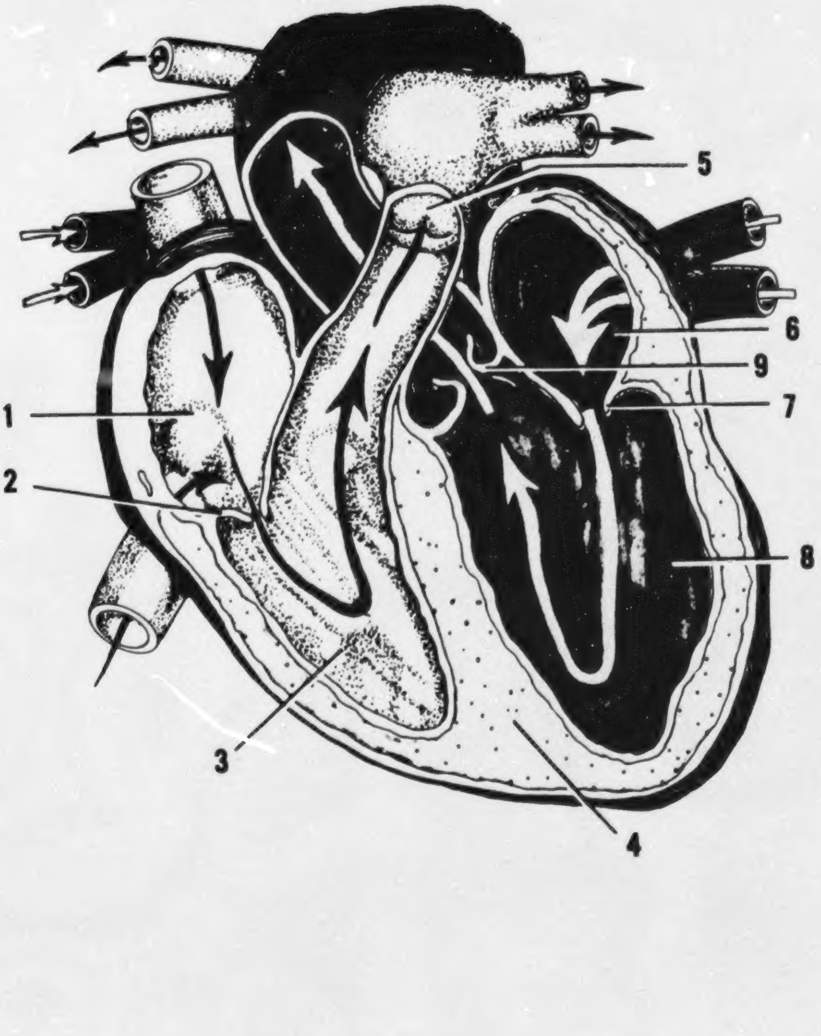
UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAM OF THE HEART

Question #4, e--page XX-123

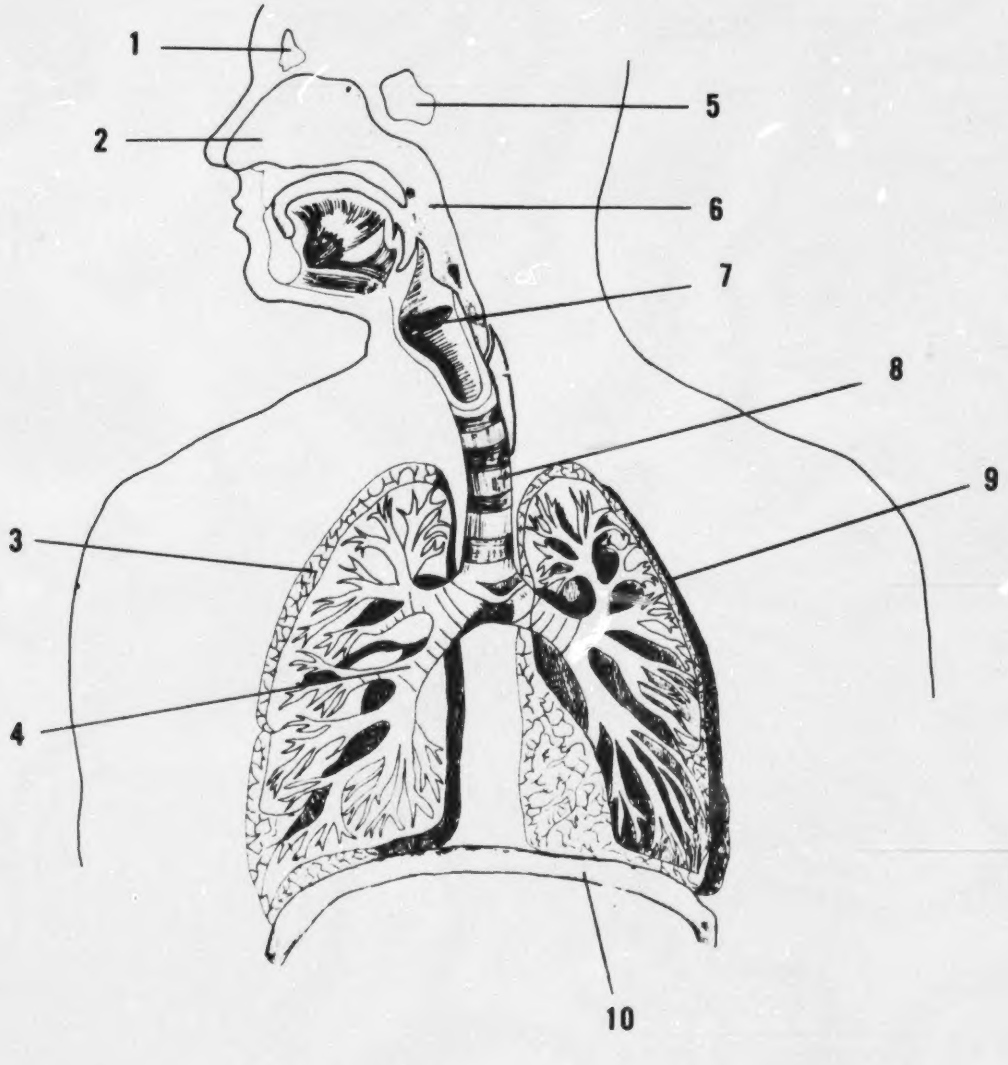


UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAM OF THE RESPIRATORY SYSTEM

Question #5, e--page XX-128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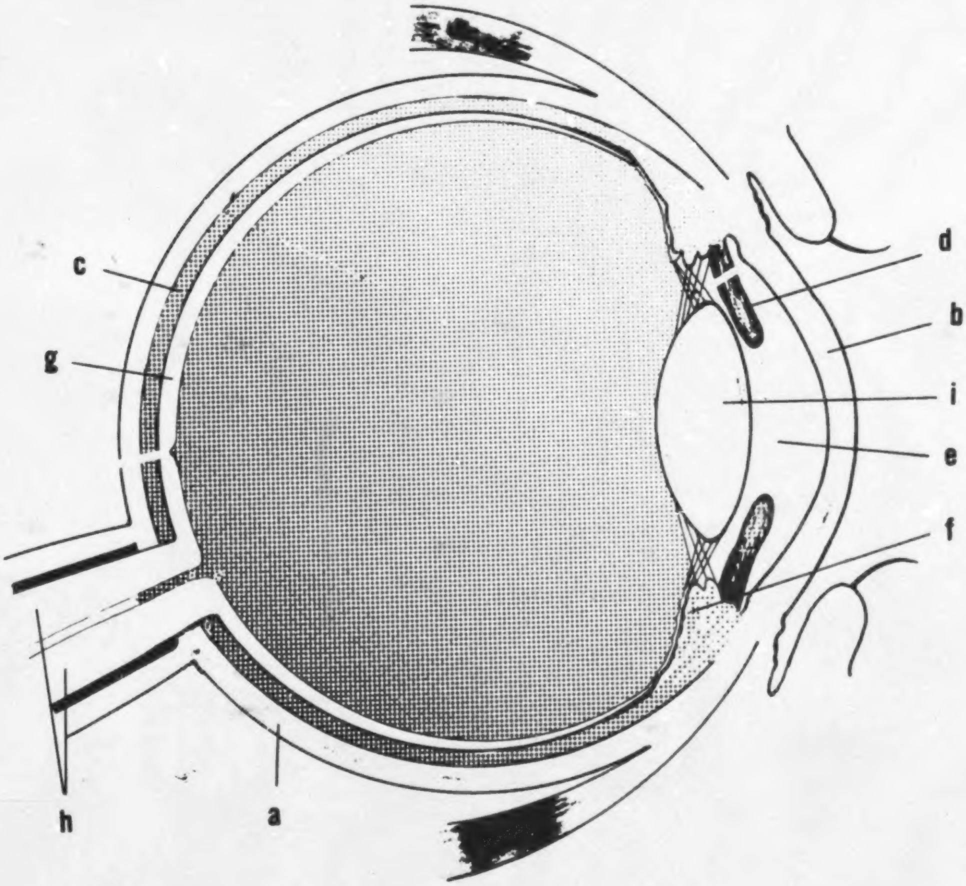
UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAM OF THE EYE

Question #6, e, (1)--page XX-129

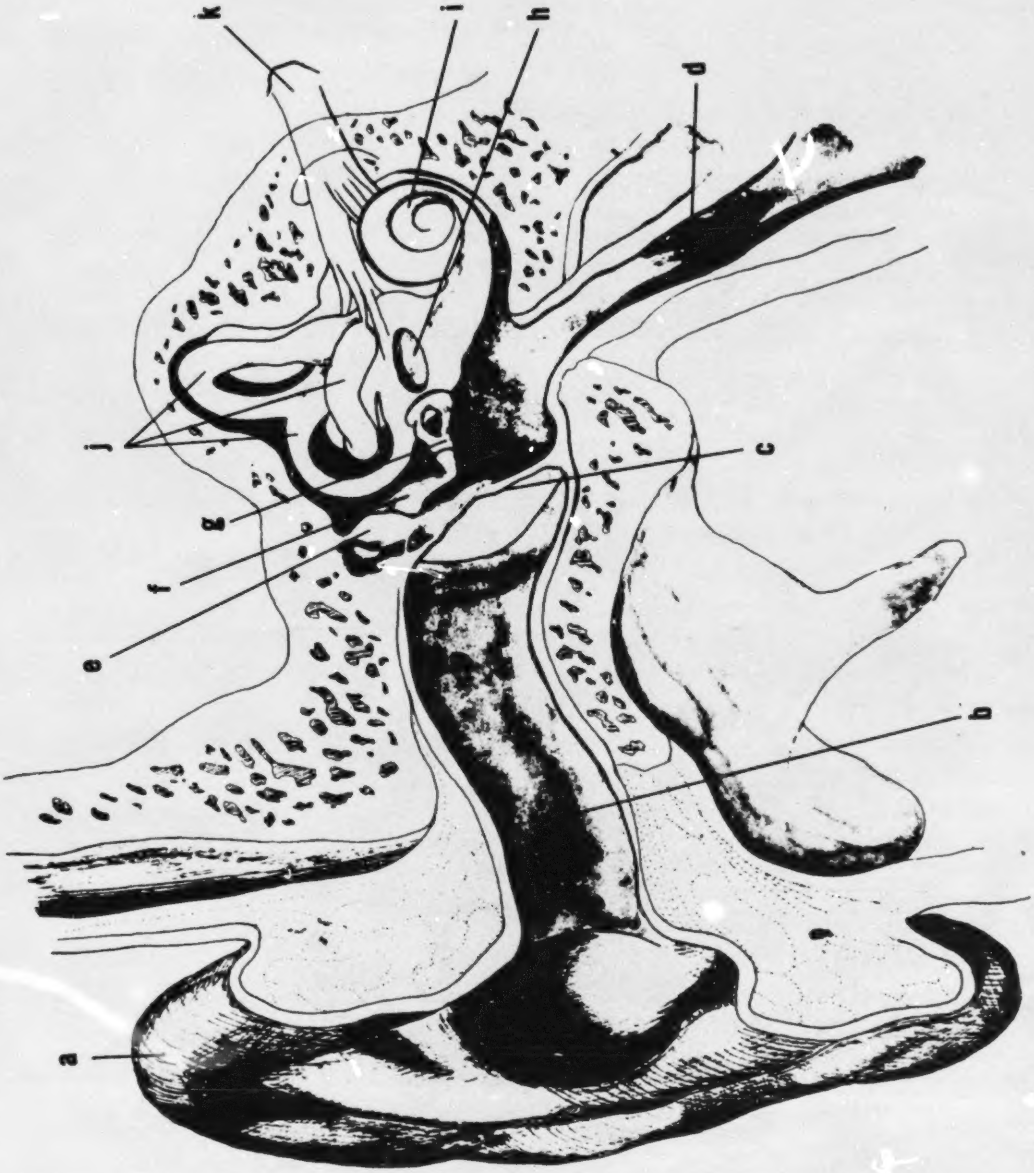


UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAM OF THE EAR

Question #6, f, (1)--page XX-130

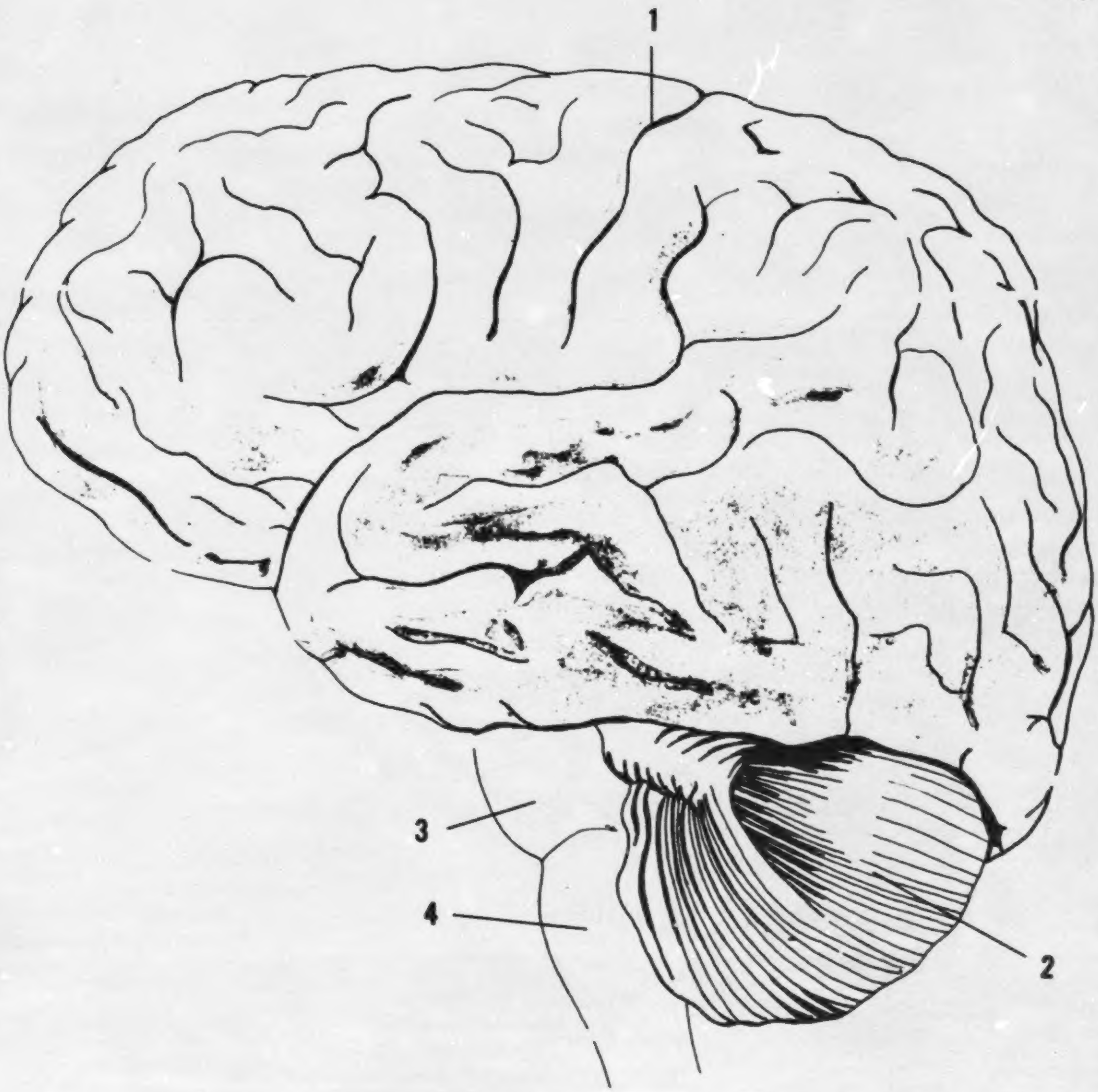

k
i
h
d
j
g
c
f
e
b
a

UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAM OF THE BRAIN

Question #6, i--page XX-132

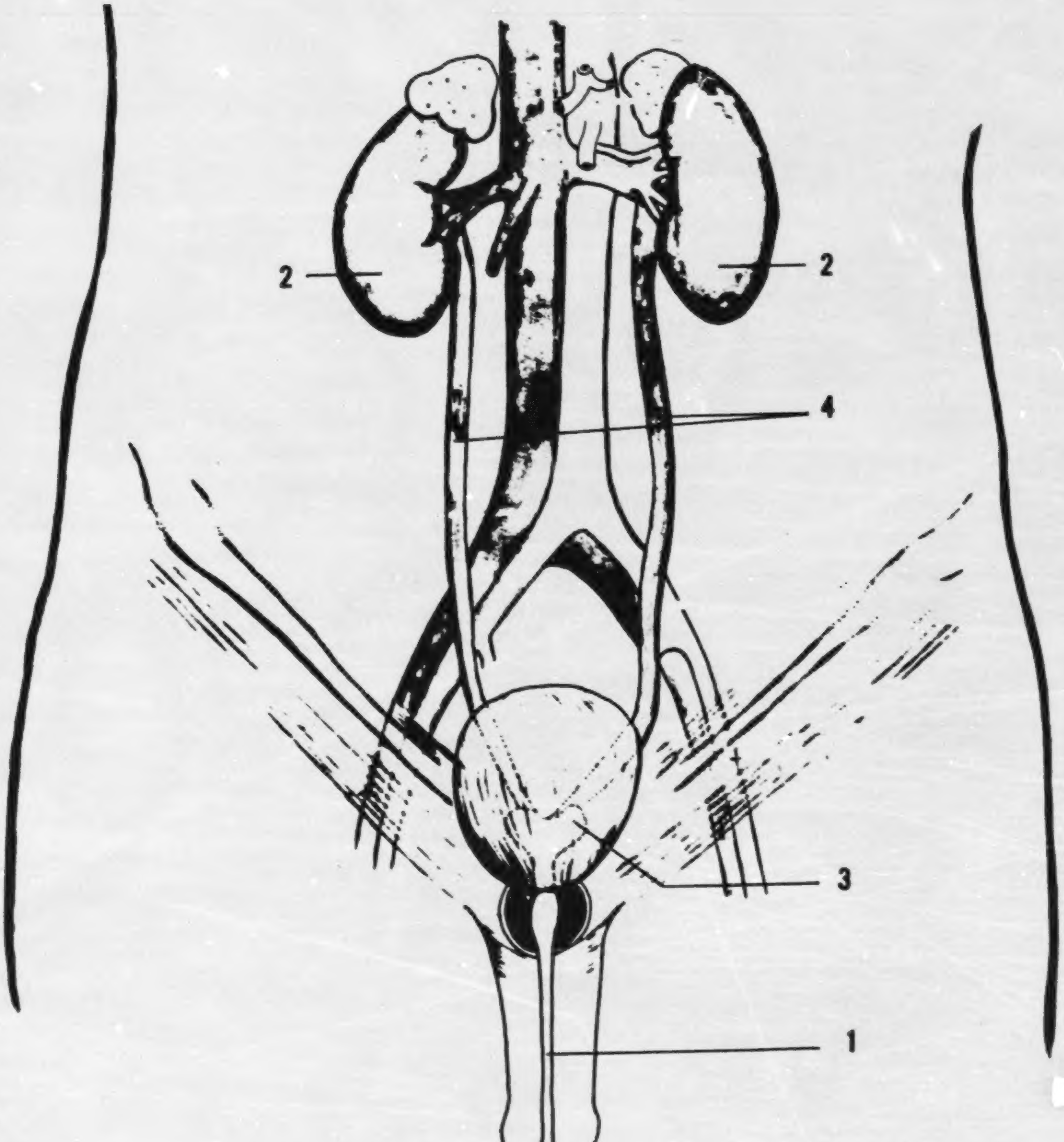


UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAM OF URINARY SYSTEM

Question #7, h--page XX-135

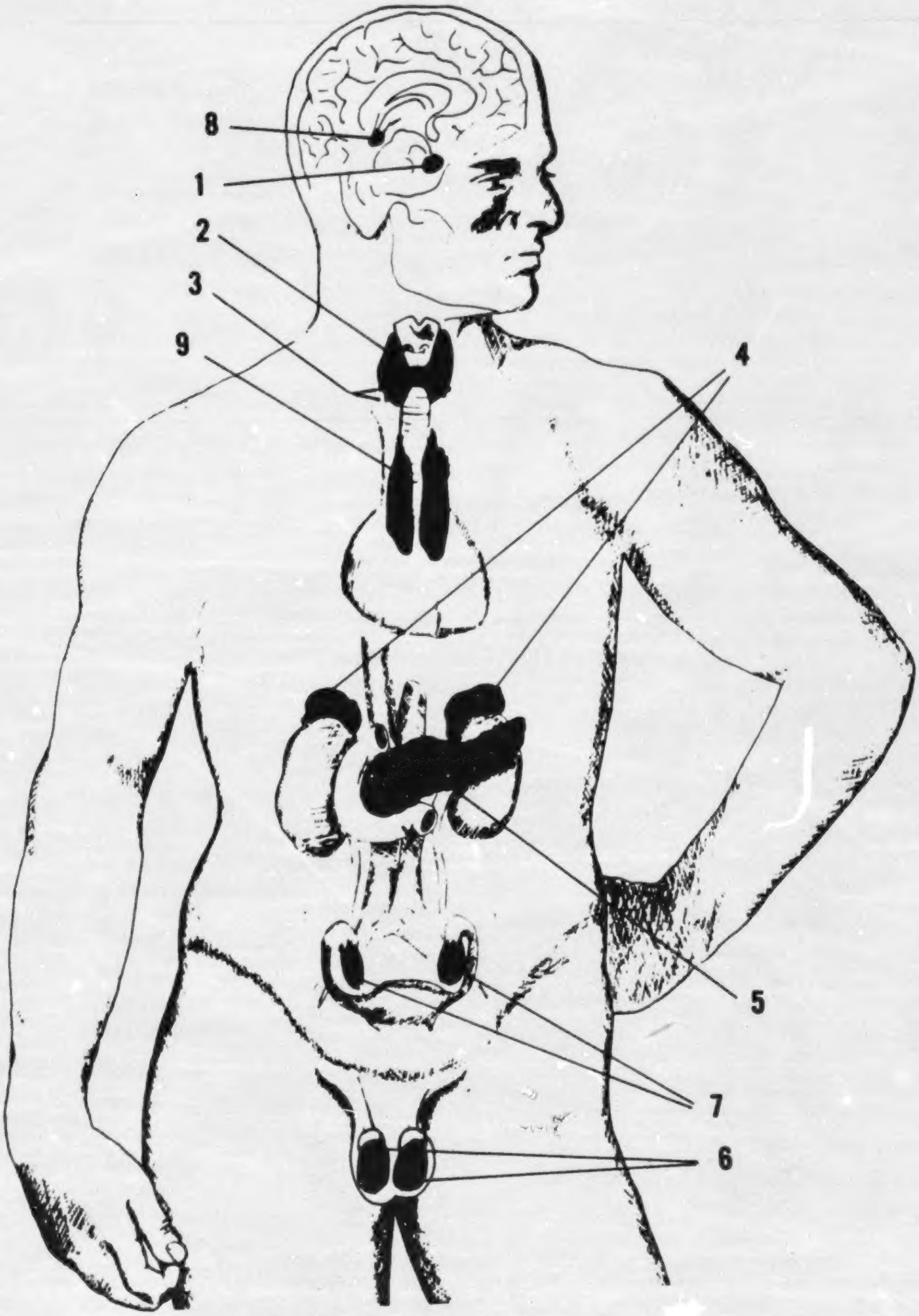


UNIT XX

ANATOMY AND PHYSIOLOGY

DIAGRAM OF ENDOCRINE GLANDS

Question #9, d--page XX-143



UNIT XX

ANATOMY AND PHYSIOLOGY

ANSWERS TO UNIT TEST

1. Organization and general plan of the body

   a. (1) thoracic
      (2) lungs
      (3) abdominal
      (4) cranial
      (5) spinal cord

   b. (1) frontal plane
      (2) sagittal
      (3) transverse

   c. (1) superior
      (2) inferior
      (3) anterior
      (4) posterior
      (5) medial
      (6) lateral
      (7) proximal
      (8) distal

   d. (1) See XX-TM-1--Location of Body Cavities, Lateral View
      (2) See XX-TM-2--Human Body, Lateral View and Human Body, Posterior View

2. Skeletal and Muscular Systems

   a. f (1)
      a (2)
      e (3)
      b (4)
      c (5)
      h (6)
      d (7)
      g (8)

   b. (1) Supports and gives shape to the body
      (2) Protects internal organs
      (3) Makes movement possible
      (4) Produces blood cells

c. (1) appendicular
(2) axial
(3) axial
(4) axial
(5) appendicular
(6) appendicular
(7) appendicular
(8) axial
(9) appendicular
(10) axial

d. (1) kyphosis
(2) simple fracture
(3) bursitis
(4) arthritis
(5) dislocation
(6) greenstick
(7) osteomyetitis
(8) sprain
(9) tuberculosis
(10) compound fracture
(11) rickets
(12) scoliosis
(13) lordosis

e. (1) skeletal or voluntary
(2) smooth or involuntary
(3) cardiac

f. (1) (a) cranuim
(b) maxilla
(c) mandible
(d) clavicle
(e) sternum
(f) xiphoid process
(g) costal cartilage
(h) pelvic girdle
(i) carpals
(j) metacarpals
(k) phalanges
(l) patella
(m) tarsals
(n) metatarsals
(o) phalanges

(2) (a) skull
(b) cervical vertebrae
(c) scapula
(d) thoracic vertebrae
(e) lumbar vertebrae
(f) sacrum
(g) humerus
(h) olecranon process of ulna
(i) radius
(j) ulna
(k) femur
(l) fibula
(m) tibia

3. The digestive system

a. g (1)
a (2)
c (3)
e (4)
b (5)
h (6)
f (7)
d (8)

b. mouth (1)
small intestine (2)
large intestine (3)
liver (4)
teeth (5)
tongue (6)
mouth (7)
saliva (8)
stomach (9)
pancreas (10)
pancreas (11)
gall bladder (12)
large intestine (13)
small intestine (14)
stomach (15)
liver (16)
gall bladder (17)
saliva (18)
tongue (19)
liver (20)

c. (1) mouth
(2) lipase
(3) curdles milk
(4) pancreas
(5) trypsin
(6) starch
(7) protein
(8) sucrase
(9) maltose
(10) liver

d. (1) tooth decay
(2) viral infection of salivary glands
(3) inflammation of the lining of the stomach
(4) stomach distress with an urge to vomit
(5) inflammation of the appendix
(6) abnormal delay in, or infrequent bowel movement
(7) abnormally frequent, watery, bowel movements
(8) chronic disease in which normal liver cells are replaced by scar tissue
(9) inflammation of the liver
(10) disease in which sugar is not used by the cells because of a lack of insulin

e. (1) salivary glands
(2) esophagus
(3) stomach
(4) pancreas
(5) liver
(6) gall bladder
(7) small intestine
(8) large intestine
(9) appendix
(10) anus

4. The circulatory system

a. (1) transportation

(2) defense against disease

b. (1) plasma

(2) bone marrow

(3) oxygen

(4) destroy invading bacteria

(5) required for clotting of blood

c. (1) transfusion

(2) medical-legal identification

d. (1) transfusion

(2) pregnancy

e. (1) right atrium

(2) tricuspid valve

(3) right ventricle

(4) septum

(5) pulmonic valve

(6) left atrium

(7) mitral valve

(8) left ventricle

(9) aortic (semilunar valve)

f. (1) the rhythmic throbbing felt in an artery as a result of the beating of the heart

(2) pressure blood exerts on the inside walls of blood vessels

(3) pressure during heart muscle contraction

(4) pressure during relaxation of heart muscle

g. (1) phlebitis

(2) hemorrhage

(3) murmur

(4) coronary occlusion

(5) arteriosclerosis

(6) embolus

(7) varicose veins

(8) ischemia

(9) hypertension

(10) atherosclerosis

(11) coronary thrombosis

(12) anemia

(13) thrombus

(14) aneurysm

5. The respiratory system

a. d (1)

f (2)

b (3)

c (4)

g (5)

h (6)

e (7)

a (8)

b. (1) sinuses

(2) larynx

(3) trachea

(4) alveoli

(5) nasal cavity (nostrils)

(6) contractions cause air to enter lungs

(7) pleura

c. (1) anoxia

(2) asphyxia

(3) hyperpnea

(4) Cheyne-Stokes respiration

(5) apnea

d. (1) asthma

(2) tuberculosis

(3) sinusitis

(4) pneumonia

(5) pleurisy

(6) common cold

(7) influenza

(8) cough

(9) hay fever

(10) emphysema

(11) epistaxis

e. (1) sinus

(2) nasal cavity

(3) right lung

(4) right bronchus

(5) sinus

(6) pharynx

(7) larynx

(8) trachea

(9) left lung

(10) diaphragm

6. The nervous system

a. (1) central nervous system

(2) peripheral nervous system

(3) autonomic nervous system

b. (1) cerebrum

(2) medulla

(3) cerebellum

(4) pons

c. (1) meninges--layers of tissue that surround and protect the spinal cord and brain

(2) cerebrospinal fluid--fluid that surrounds and protects the spinal cord and brain

d. (1) neuron

(2) dendrites

(3) axon

(4) synapse

e. (1) Parts of the eye

(a) sclera

(b) cornea

(c) choroid

(d) iris

(e) pupil

(f) ciliary body

(g) retina

(h) optic nerve

(i) lens

(2) Discussion should include:

(a) light rays enter the eye through the cornea

(b) lens changes thickness to focus rays on retina

(c) retina translates light energy to nerve impulses

(d) nerve impulses are conducted to the visual center of the cerebrum

f. (1) Parts of the ear

(a) pinna

(b) auditory canal

(c) tympanic membrane

(d) eustachian tube

(e) malleus

(f) incus

(g) stapes

(h) oval window

(i) cochlea

(j) semicircular canals

(k) auditory nerve

(2) Discussion should include:

(a) sound waves enter external auditory canal

(b) tympanic membrane vibrates, causing ossicles to vibrate

(c) vibrations are transmitted mechanically from ossicles to the oval window

(d) vibrations of the oval window cause pressure waves in the liquid of the cochlea

(e) nerve centers in cochlea are stimulated by pressure waves, impulses transmitted from cochlea, by means of the auditory nerve to the hearing center of the brain

g. Answers should include any five of the following:

(1) smell

(2) touch

(3) pain

(4) hunger

(5) thirst

(6) pressure

(7) temperature

(8) position

(9) taste

h. d (1)
j (2)
k (3)
o (4)
m (5)
n (6)
b (7)
a (8)
l (9)
c (10)
i (11)
f (12)
g (13)
h (14)
e (15)
p (16)

i. Diagram of brain
(1) cerebrum
(2) cerebellum
(3) pons
(4) medulla

7. The urinary system

a. g (1)
c (2)
a (3)
e (4)
h (5)
i (6)
b (7)
f (8)
d (9)

b. (1) urethra
(2) kidneys
(3) urinary bladder
(4) ureters

c. Discussion should include the following:
(1) regulation of water balance of the body
(2) excretion of waste products from the blood
(3) regulation of the acid-base balance of the body

d. (1) blood flows to kidney by means of renal artery

(2) waste products (urea, uric acid, creatinine, and salts) are filtered from the blood by the kidney

(3) the waste (urine) flows from the kidney by means of the ureter to the urinary bladder

(4) the filtered blood returns to the circulating blood

e. (1) oliguria

(2) incontinence

(3) glycosuria

(4) calculus

(5) edema

(6) urethritis

(7) nephritis

(8) dysuria

(9) cystitis

(10) polyuria

(11) uremia

(12) anuria

f. (1) The patient's blood is cleaned by dialysis by passing it through an artificial filter instead of the kidney.

(2) A transplant is the replacement of a diseased kidney with a healthy kidney provided by a donor.

g. The Living Bank is an organization that coordinates the donation of organs.

h. (1) kidneys

(2) ureter

(3) urinary bladder

(4) urethra

8. a. The reproductive system

g (1)

j (2)

m (3)

h (4)

a (5)

b (6)

l (7)

d (8)

c (9)

n (10)

e (11)

f (12)

i (13)

k (14)

b. (1) vagina

(2) ovum

(3) testes

(4) prostate

(5) sperm cell

(6) vulva

(7) perineum

(8) ductus deferens

(9) scrotum

(10) uterus

(11) ovaries

(12) epididymis

(13) penis

(14) fimbriae

(15) fallopian tubes

(16) seminal vesicles

c. (1) 28 days

(2) about the middle of the 28 day cycle

(3) uterine wall

(4) sloughs off and is expelled

(5) the loss of the uterine lining leaves some areas bleeding, thus blood is also discharged

(6) begins to prepare again for pregnancy

(7) production of ova

(8) stage at which menstrual cycle ceases

(9) hormones

d. (1) true

(2) true

(3) false

(4) false

(5) true

e. (1) miscarrage

(2) therapeutic abortion

(3) criminal abortion

(4) ectopic pregnancy

(5) spontaneous

(6) induced abortion

f. l (1)

n (2)

c (3)

g (4)

f (5)

k (6)

h (7)

a (8)

d (9)

e (10)

i (11)

m (12)

j (13)

b (14)

9. The endocrine system

a. c (1)

a (2)

f (3)

e (4)

d (5)

b (6)

b. (1) pituitary

(2) testes

(3) adrenal

(4) Islets of Langerhans

(5) parathyroid

(6) ovaries

(7) thyroid

(8) adrenal

(9) pituitary

(10) pituitary

c. (1) dwarfism

(2) exophthalmic goiter

(3) giantism

(4) diabetes mellitus

(5) simple goiter

d. (1) pituitary

(2) thyroid

(3) parathyroid

(4) adrenal

(5) Islets of Langerhans

(6) testes

(7) ovaries

(8) pineal

(9) thymus

END

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